FOOD MANUFACTURE

Incorporating Food Industries Weekly

ONARD HILL LIMITED, 17 STRATFORD PLACE, LONDON, W.1 MAY 1, 1950

the 'Edicol' palette

of colours for soft drinks and cordials

Most people enjoy drinking something long and cool and colourful—you needn't necessarily be young to appreciate a drink that twinkles at you. Suitable 'Edicol' colours for soft drinks and cordials are specially prepared to give crystal clear solutions—and the clearer the colour, the brighter the twinkle!

ICI

Please write for further information to your nearest I.C.I. Sales Office

D.134

FOOD MANUFACTURE

Vol. XXV. No. 5 · Published Monthly · May 1, 1950

CONTENTS

	Page
Editorial	177
The Quick Freezing of Fish. Part II. *Specially contributed*	181
The Practice and Science of Breadmaking. *D. W. Kent-Jones, Ph.D., B.Sc., F.R.I.C.*	184
Two Centuries of Brewing	189
Food and Health in Britain	193
Ministry of Food—Statutory Instruments	196
Efficient Operation of Drying Plant. Part III. *Leo Walter, A.M.I.Mech.E., A.M.I.Plant.E.*	197
Iodised Salt Standards	199
Food Packaging. *Frank England*	200
Food Miscellany	202
Trade News	203
Information and Advice	219
Recent Patents, Trade Marks, and New Companies	220

Published by Leonard Hill Limited, 17, Stratford Place, London, W.1. Mayfair 7383.

Price per copy 2/6. *Subscription rates on application.*

PURE GELATINES
POWDERED or KIBBLED

For Food Manufacture

Laboratory Controlled
Perfect Keeping Qualities
Standardised Grades
Absolute Uniformity in Deliveries
Samples & Prices on application

A bright sparkling Jelly can only be made from a Gelatine of good strength, clarity and colour. All our grades are tested strictly according to the methods of the British Standards Institution and standardised to a definite specification.

Our Gelatines are also submitted to the most exacting laboratory tests to ensure complete freedom from harmful impurities.

OURY, MILLAR & CO LTD.
THAMES HOUSE, QUEEN STREET PLACE,
TELEPHONE:- CENTRAL 2672 LONDON, E.C.4. OLMENTH-CANNON LONDON

The precisely-timed dexterity of the Juggler represents a triumph in perfected co-ordination between *every* part of the Performer's mental and physical make-up.

We have found this also an excellent precept for the successful running of a business. We believe that "Heads" must work with "Hands" and that every small detail is a vitally essential ingredient of the WHOLE. That is why Padley and Venables' Service continues to win complete satisfaction from both old and new customers.

B.I.F. STAND NO. D.422
CASTLE BROMWICH

Suprex
STAINLESS STEEL

in all forms and finishes

SHEET · STRIP · BAR
WIRE · SECTIONS
TUBE · CASTINGS
COMPONENTS
FOR FOOD PLANT

PADLEY & VENABLES LTD

SUPREX WORKS · LIVERY STREET · BIRMINGHAM 3 · Phone: CENTRAL 1707

P&V

FOOD MANUFACTURE

Vol. XXV, No. 5 May 1, 1950

Obsequies in Bacon

AT THE time of writing, Mr. James Dillon, Minister of Agriculture for Ireland, is in London to meet Mr. Maurice Webb, the purpose of his visit being "to sell pigs, bacon, eggs, canned meat, cream, and cheese to the British people."

At a Press conference Mr. Dillon said that he would offer just about as much as we cared to buy, as in Ireland they had now reached the point at which the domestic demand for the commodities mentioned was saturated. "It is," he said, "a modest hope that we can bury you in bacon." This will sound familiar to those who went on the Food Group Tour to Dublin in 1948 when, in a brilliant speech at the dinner given to the Group by the Irish Food Manufacturers' Federation, Mr. Dillon offered ample supplies of canned meat—at a price.

While we do not deny that certain food controls must still be maintained, we fail to see the necessity for the meetings of Cabinet Ministers from Westminster and Dublin to discuss, control, and regulate the very simple trade with Ireland in eggs and bacon, about which there never was and never should be the least difficulty. Under private enterprise, a couple of commercial travellers from Leadenhall Market spending a week in Dublin could produce far more satisfactory results.

Compulsory Iodine

The proposed mass dosing with iodine of the whole population of Great Britain, details of which are published elsewhere in this issue, is a matter which needs further consideration. We have carefully read the joint memorandum issued by the Ministry of Health and the Department of Health for Scotland by which we note that the incidence of goitre in women was found to be "50 per cent. at Hook Norton and 48 per cent. in the Forest of Dean, and in children 43 per cent. at Sherborne, 42 per cent. at Glen Urquhart, 23 per cent. at Lockerbie Burgh, and 26 per cent. at Okehampton!" We should have been interested to hear about Derbyshire and Cornwall; the latter was alleged to be one of the most goitrous counties in England.

We particularly note the wording of one finding of the Goitre Sub-Committee (Medical Research Council Memorandum No. 18, 1948), which reads: "Weighing all the evidence, the Sub-Committee were of opinion that the incidence of 'goitre' *seemed to be* on the increase." (The italics are ours.) We would have preferred a more categorical statement.

Our first impressions were deepened by a letter from Dr. P .H. J. Turton, Medical Officer of Health, Heanor, Derbyshire, published recently in *The Times*. His opinion is that the incidence of goitre in children and adolescents varies inversely with many factors, and by no means the last of these is the unpredictable vagaries of a number of observers, and he deplores the blunderbuss prescribing of the hit-or-miss variety.

Dr. Turton points out that the amount of iodised salt consumed cannot be controlled, and that goitre prevention with small amounts of iodine over a period of years is not uniformly harmless; he calls attention to the evidence that during the period 1925-30 the increased death rate from thyrotoxicosis was due to the increased use of iodine and iodides in the prophylaxis and treatment of goitre.

The suggested recommendation that the retail sale of cut-lump salt, which it would not be convenient to iodise, would be discontinued means to say that all sources of non-iodised salt would be cut off.

During the three months' grace which has been allowed for representations to be made before the provisions are given statutory effect, it is possible that a good deal of valuable and enlightening discussion will ensue.

Buying from America

The primary purpose of a new service offered by the Marshall Plan Administration is to help small businesses by the publication in the United States of the needs of foreign importers as they develop.

To spread this information the Office of Small Business in Washington uses a nation-wide system, employing forty-three United States Department of Commerce Offices, and more than 250 voluntary "field counsellors." In effect, the E.C.A.'s Office of Small Business, with its counselling service, acts as an aid to the purchasing agent. For example, a British importer who wants a certain American commodity can use the service to secure the widest com-

petitive bidding for his order and all American companies interested in the order can then investigate the possibility of obtaining it.

It is possible that the pre-war source, to which a British importer would naturally turn first, might still offer the best deal; but it is also possible that because of relative availability of the commodity, unused capacity, the desire to enter a new market, or other market conditions, a new firm would sell more cheaply or deliver more quickly than the pre-war supplier.

The value of this service—both to the British and American business community—depends upon how much advance information on future purchases reaches the Office of Small Business. Only the British purchaser can supply this. It is useful to know that a British importer plans to be in the market for a commodity at some future date, but the more detailed the information submitted, the more helpful it will be.

The best type of information is a request for bids. The Small Business Office will publish the request, and in that way the British importer can be sure that all potential suppliers in the United States will have the opportunity to submit bids. For purchases of those commodities which do not lend themselves to bidding, the Office of Small Business will publish all details of the proposed purchase, and any interested United States supplier can contact the British importer.

Vegetable Competitor for Gelatin

Until recently, animal proteins have had things all their own way so far as gelling properties are concerned; but now an accidental discovery (not entirely unknown even in these days of research by master plan and organised routine) has led to the recognition of a rival in the form of a vegetable protein gelling material, which is now covered by U.S. patent. An extraction product of soya bean meal was to be used at a demonstration of meringue making, a mixture of this product with sugar and water having been prepared in advance. While waiting for the arrival of her audience, the demonstrator left the mixture on the stove to keep it warm. Within twenty minutes it had formed a jelly-like mass, which was found to be insoluble in water on heating.

The material is composed of about 55 per cent. protein and 45 per cent. carbohydrate. The processing involves a solvent extraction of soya bean meal; alcohol washing removes any alcohol-soluble matter and a subsequent water extract is spray dried to give a white powder. A 10 per cent. solution of this powder forms an irreversible gel on heating to 190° F. It is possible that uses may be found for the product in the ice cream, confectionery, and cooked meat industries.

Vegetable sources are likely to give a cheaper starting point for a gelling material than the usual animal sources, but it remains to be seen whether this new substance, which is now being manufactured on a small scale, can compete with gelatin. The extraction processes may prove more costly, thus cancelling out the initial economy; but efficient solvent-recovery arrangements may provide the answer to this problem.

Progress in Lard Preparation

An interesting review of progress in the manufacture of lard is given by Frank C. Vibrans, of the American Meat Institute Foundation, Chicago (*Food Industries*, **20**, 855-858). Pressure cooking and "dry rendering" have superseded the open-kettle method of rendering hog fat.

The demand has arisen for bland shortenings which need not be kept under refrigeration, but which can be stored in the larder without melting or becoming rancid. Resistance to temperature is obtained by hydrogenation or by the addition of "lard flakes" to raise the melting point.

A bland lard with higher smoking temperature has been obtained by removing free fatty acids and deodorising with steam. Stronger emulsifying property has been imparted by the addition of mono- and di-glycerides. In many instances, the only change needed in plant design is the adaptation of procedures to the individual plant requirements.

Although many of the proposed improvements for lard are relatively new, some have been in limited use for a number of years, and one, marketed in the U.S.A. since 1940, contains "lard flakes," di-glycerides, mono-glycerides, resin guaiac, and citric acid. Another of these bland products which was put on the American market in 1948 contains, in addition to lard, "lard flakes," vegetable oil, nordihydroguaiaretic acid, and citric acid.

The retardation of rancidity may be accomplished by the addition of an antioxidant to the lard before packaging and by the addition of synergists which greatly increase the stabilisation of the lard when added with the antioxidant. Citric and phosphoric acids are synergists for the antioxidant nordihydroguaiaretic acid.

In the U.S., several antioxidants have been accepted by the Meat Inspection Division of the Bureau of Animal Husbandry, the most important of these being resin guaiac with or without citric acid as a synergist; nordihydroguaiaretic acid (sold under the trade mark NDGA) with or without citric or phosphoric acid as a synergist; propyl gallate with or without citric acid; and tocopherol concentrate in vegetable oil. A mixture of propyl gallate with or without citric acid and lecithin in corn oil has the trade name of G-4.

Spoilage in Canned Tomato Juice

In the course of an investigation on the effect of various ingredients of acid food products on the thermal resistance of micro-organisms, observations were made by E. E. Anderson, W. B. Esselen, Jr., and C. R. Fellers, Department of Food Technology, University of Massachusetts (*Food Research*, **14**, 6, 499), on the influence of such substances as acids, salt, sugars, certain spices, sodium benzoate, and ascorbic acid on the thermal resistance of *Bacillus thermoacidurans* in tomato juice. This organism was originally described by Berry (*J. Bact.*, **25**, 72-73, 1933) and was implicated as a cause of spoilage in canned tomato juice. Since then considerable work has been reported on spoilage of tomato juice by this organism and the process requirements for its destruction in this product.

The effect of adding salt in concentrations varying from 1 to 8 per cent. caused progressive decreases in the thermal destruction time.

Sucrose and dextrose were the only food materials that enhanced the heat resistance of the test organism. Incorporation of 50 per cent. of sucrose or dextrose in the substrate resulted in an increase of 200 to 300 per cent. in destruction time over the control. Lower concentrations of these sugars gave correspondingly less protective effects.

Citric, acetic, and lactic acids, in concentrations of 0·5, 1, and 2 per cent., proved to be effective in reducing the thermal death time of *B. thermoacidurans*. Based on the percentage of acid used, the order of the efficiency of the acids in lowering the destruction time was lactic, citric, and acetic; while if based on the hydrogen-ion concentration the order would be acetic, lactic, and citric.

Neither 0·1 per cent. sodium benzoate nor 0·2 per cent. ascorbic acid (200 mg. per pint) in tomato juice resulted in significant changes in the thermal resistance of *B. thermoacidurans*.

Amino Acids in Fish

In view of the preponderant role played by fish in the British national diet, the nutrition report presented by Dr. E. J. Cameron at the Canners' Convention in Washington in which he discusses the protein content of amino acids in fish is of considerable interest.

Summarising his report, Dr. Cameron states that by 1948 the use of microbiological methods for amino acid estimation was generally accepted, and it appeared practical for a broad protein survey on a number of canned fish and meat products to be undertaken.

The essential amino acid patterns for the various fishery products were found to be very similar. Two of them (lysine and threonine) predominated in all samples, at times reaching more than 100 per cent. of the recommended daily intake. Three others (isoleucine, leucine, and valine) followed fairly closely, and the remaining three (methionine, phenylalanine, and tryptophan) ran somewhat below 50 per cent., but were still present in very substantial quantities.

At this stage of consideration, said Dr. Cameron, the evaluation of the importance of these "essentials" on the basis of specific physiological virtues was not being attempted. Future research may show that one or another of them is especially important to a particular body function, but at this time these should be considered as equally valuable and necessary to protein requirements.

Surface Discoloration of Sausages

Sausages prepared from cured, comminuted meats are subject to several types of spoilage, the majority of which are manifested by a visual change in colour of the product. Most, but not all, of these discoloration problems are known to be of microbial origin. One of the types of spoilage is due to bacterial contamination on the surface of the sausage after processing which, under appropriate conditions, results in a change of colour of the cured meat pigment to a dull green, and thence to a faded colour. This change may occur on the uncut surface, as in the case of wieners or other small sausages, or on the sliced surface of such products as bolognas, luncheon meat loaves, and other cold cuts.

The first evidence of spoilage is the appearance of small greenish spots on the damp surface of the product, which tend to spread and cover the entire surface in due time if favourable conditions are present. Accompanying the surface discoloration, a slight "greasy" or slimy appearance of the product may be noted in most cases. The discoloration usually penetrates the sausage to a depth of 1 to 2 mm. A freshly cut surface invariably reveals an interior that is normal in appearance, odour, and flavour.

C. F. Niven, Jr., A. G. Castellani, and Virginia Allanson conducted a detailed study on thirty cultures isolated from outbreaks of greenish discolorations on the surface of sausages (*J. Bact.*, **58**, 5, 1949). Twenty of the cultures comprised a homogeneous and distinct group of heterofermentative lactobacilli that belonged to one serological group.

The remaining ten cultures were members of the genus *Leuconostoc*, but these cultures failed to produce mucoid colonies on sucrose agar, although this sugar was fermented.

All sausage-greening cultures were salt-tolerant and capable of growing at low temperatures, and evidence was presented by the authors, which indicates that the surface discoloration of sausages results from the production of hydrogen peroxide by the micro-organisms.

Eliminating Juice Losses

Natural unfortified apple juice maintained in a colourless condition with nitrogen, carbon dioxide, and possibly small amounts of ascorbic acid, could compete very successfully on a price level with clarified apple juice, according to a report by F. E. Atkinson and C. C. Strachan of the Dominion Experimental Station, British Columbia.

This is possibly owing first to the fact that 10 to 15 per cent. of apple juice being clarified is lost in the clarification process; sometimes this loss is as high as 20 per cent. Secondly, with the natural juice no clarifying agent, such as tannin and gelatin, is necessary. Thirdly, it is a straight-line operation requiring no storage tank and extra labour for adding clarifying agents, filtering, or cleaning of tanks.

Animal Feedingstuffs

An objective survey of the animal feedingstuffs situation was given by Mr. F. G. Bevin in a paper read to the Farmers' Club last month. Although in no sense a Government spokesman, Mr. Bevin saw no really satisfactory alternative to bulk buying so long as the Argentine insists upon bulk selling. A return to private buying could be disastrous, since all dockside costs in the Argentine, including demurrage, are added to the buyers' accounts. The dockers abroad work shorter hours for higher wages, and all the consequences fall upon the buyer, whether a bulk buyer of the British Mission or a semi-private buyer as in the case of other European countries.

Since it is only with Argentine transactions in feedingstuffs that we have retained bulk buying, Mr. Bevin felt that "this method is highly convenient," and in his opinion "both the trade and agriculture should consider most carefully before they agree to any material alteration being made; otherwise it is probable that they would find the financial burden too great to bear." He did not support the theory that the Argentine had adopted bulk selling in reply to our adoption of bulk buying. They liked bulk selling and we could not force them to abandon it even if we wanted them to do so.

The total supply position had greatly improved—rationed feedingstuffs had risen from 2,400,000 tons in 1947-48 to 6,000,000 tons in 1949-50. Quantity was, however, only one aspect of the problem. It was impossible not to feel disturbed by a long-term prospect of protein scarcity, for cereals could not economically be used to excess. Countries which in pre-war days had seemed to be inexhaustible suppliers of protein could now send us next to nothing. Mr. Bevin warned his farming audience that "no country has a worth-while surplus of good protein. That is why the apparent mishandling of the Groundnut Scheme is so tragic."

"Our days of plenty, of pick and choose where and when we like, are over, and if we can't get what we like, we must try to like what we can get." So long as proteins remained so precariously short, Mr. Bevin felt that feedingstuffs rations were best eked out in the form of compounds. It meant fair distribution. "If there is not sufficient roast beef for all, each has his share of the best available sausage. . . . As proof I point to the flood of milk and the bacon yield which modern rations have fully demonstrated."

Crocodiles Without Tears

Those who like to concern themselves with other people's troubles may be interested in the problems being encountered on the shores of Lake Nyasa which, according to a *Times* report, have been giving the Department of Game, Fish, and Tsetse Control furiously to think.

Crocodiles and cormorants are depleting the fish population in the lake. The matter is not without its complications. Crocodiles like eating cormorants, but if the anti-crocodile campaign which has been launched under the leadership of Mr. W. H. Jollyman, a retired English chemist, is successful, there may be a risk of upsetting the balance of nature. If there are fewer crocodiles to keep down the cormorants, which are voracious fish-eaters, there will be more cormorants and fewer fish.

The armaments include hook and line, rifle, and poison. Poison bait is the main method of destruction, and dead cormorants with a ball of cyanide introduced in the flesh are hung on bushes above the water, out of the way of the fish, but which the crocodiles can reach.

"Nipping the crocodile in the egg" is an important part of the campaign. In ten days 3,751 eggs were brought in by Africans, and 734 in another three days. Mr. Jollyman claims on one occasion to have caught three crocodiles in a butterfly net, but admits that these captures were in the form of new-laid eggs.

So much for the crocodiles. There remain the cormorants, and we were wondering whether this problem could be solved by taming these birds while young, which once was done in England, where the "Master of the Cormorants" was one of the officers of the Royal Household. This practice is nearly obsolete in Europe, although it is said to be still common in China. A strap, which is fastened round the bird's neck without impeding its breathing, prevents the cormorant from swallowing its captures. In this way there would be no danger in getting rid of the crocodiles as there would be no necessity for them to keep down the cormorants which, if trained, would become useful members of the community.

The Quick Freezing of Fish

SPECIALLY CONTRIBUTED

PART II

The first article in this series described the operation of quick freezing on board ship and also discussed cold storage facilities and existing systems for freezing fish. This instalment is concerned with experimental aspects and economic considerations.

FOR obvious reasons, there has been relatively little activity in the marketing centres as opposed to the landing centres. At the ports the catchers and merchants are in intimate daily contact with their raw material. They have been given preferential allocations of fish of high quality to ensure that their quick freezing plants work to capacity. They have also been given a certain degree of priority in new construction.

These two instances of encouragement are lacking at the marketing end, where the problem of variable deliveries has also to be faced. The major inland markets such as Edinburgh, Glasgow, Dundee, and Inverness cannot rely on a positive daily intake. This alone makes the economic operation of a quick freezing plant difficult and discourages any policy of mass development of freezing plants by the wholesale houses, no matter how big they may be.

Kippers in Cold Store

Instead, there has been a certain use of storage and quick freezing facilities where these exist in cold stores. Kippers offer an interesting example of this policy. It would obviously be uneconomic for a kipperer to establish a quick freezing unit and a holding store to handle his fish after smoking; consequently the kipperer hands over his smoked fish to a cold store where the packs are frozen and held, pending instructions from the owner. When market conditions permit he instructs their release.

No refrigerated transport is used, and the kippers thaw out naturally, reaching the dealer, thawed, wrapped, and ready for sale.

Despite the risk involved in establishing a freezing unit in an inland market, one Glasgow firm of wholesale fish merchants have actually established a quick freezing plant. Installed early in 1949, this plant is still in the experimental stage, and the owners agree that it is not, as yet, an economic unit. However, they plan to experiment with a wide variety of products—not necessarily in the fishing industry—and to maintain the plant continuously for a period of years to determine its value. They consider that a quick freeze unit, operated in an inland market by a single firm and on fish alone, could not hope to operate economically. Used by a group of allied interests (as in this case) and handling a range of produce other than fish, the installation could be developed into an economic proposition.

The North British Cold Storage and Ice Co., of Leith, have been pioneers in the field of general quick freezing, but with considerable interest in fish. This cold storage company was one of the first in Britain to visualise the potential field of enterprise opened up to the cold storage and ice industry by the development of quick freezing. Over ten years ago the company began to experiment on quick freezing and installed one of the first Scottish plants. The conception was the handling of any type of produce and the introduction of a general "jobbing" service to the food industry as a whole.

Experiments in Quick Freezing

To gain the necessary background of experience and to justify the plant, the management carried out a very considerable and lengthy programme of experiments on fruits, vegetables, fish, baked goods, meat, and eggs. From that valuable period of research work, which was carried out with an eye on North American practice, an excellent quick freezing service developed, to the advantage of the entire East Scotland area and of the Lothians in

Stows of ice-glazed unwrapped fish in cold store at −15° F.
Photo The North British Cold Storage and Ice Co.

A tray of quick frozen fish is unloaded from a barrow leaving the tunnel.
Photo The North British Cold Storage and Ice Co.

particular. It has not yet been possible for the fullest use to be made of these facilities, since the appropriate conditions have been lacking.

According to Mr. James Mackenzie of the North British Cold Storage and Ice Co.: "For the past month (September, 1949) we have done practically no quick freezing, due to lack of low-temperature space to accommodate the throughput of the quick freezer. We here do not like the use of the word 'glut' in connexion with quick freezing, and the fact is that we have been kept in steady and regular production from June to the end of August, principally on account of the activities of one firm for whom we have quick frozen for the past two years.

It would seem, however, that the average merchant in Scotland does not view quick freezing other than as a means for assisting in coping with gluts and fails to appreciate entirely that the plant is most costly and labour expensive, thereby calling for the continuous use of same over a considerable period. In addition to quick freezing, we have again, this year, had a very heavy tonnage of sharp freezing, and the demand for both services is increasing, but will only be met in the future if cold storage space can be found here or elsewhere to accommodate our freezing by both methods adopted here, *i.e.* quick freezing and sharp freezing."

By contrast to quick freezing in ninety minutes, the sharp freezing service operated by this company reduces the temperature at the centre of the fish, packed in 1 stone or 2 stone wooden boxes, to 0° F. in about twenty-four hours. This operation is carried out by equipment similar to that used for quick freezing, the main difference being that the air velocity is 200 ft. per minute and the air temperature −10° F. The important point of this process is that the customers' packages are not opened or repacked. There is, therefore, less handling of the goods to be done at the freezer, with consequent reduction in charges.

The Herring Industry Board have played an important part in the expansion of freezing in Scotland and in the English east coast herring ports. As part of their policy of utilising herring to the maximum extent, the Board have created a number of quick freeze points in both Scotland and England. The most recent figures are not yet available, but it is known that over the period since the issue of the 1947-1948 report the Board have expanded their work considerably. They also suffer from the difficulties of maintaining plants in fishing ports where no other major produce can be readily handled, from distance from the main consuming points, and from the overall problem of operating plants economically on a periodic basis. Their situation is even more difficult than in the white fishing section, since supplies of herring are unpredictable.

The current season started disastrously in the north-east, although latterly there have been better landings. Official figures not being available, it can only be assumed that the normal difficulties involved were increased last summer by the very poor landings and the erratic appearances of shoals. The 1947-1948 report of the Board said this on the subject

The weighing baskets are filled as the fish leave the washing machine.
Photo Herring Industry Board.

of freezing: "The importance of the provision of adequate quick freezing facilities for the herring industry is such that the Board view with concern the comparative lack of development over the past year and the absence of any evidence of substantial projects for the future expansion of this side of the industry."

Plant in Short Supply

Although the Board expected developments in quick freezing by 1948, so far these hopes have not been realised. The demands of export markets continue to limit supplies of essential plant such as compressors and electric motors for the home market, and the recent ban on industrial building has delayed the completion of works in progress.

It is typical of the state of supply that, in an effort to carry through their plan to double the freezing capacity of their Lerwick plant in 1947, the Board had to acquire and rebuild a compressor more than twenty years old—the only one of suitable capacity procurable at the time. Moreover, it has become necessary for the Board to abandon, at least for the time being, a large experimental kipper freezing project, the completion of which could not be assured before 1951.

Economic Factors

Economic factors also intervene since quick freezing involves additional costs. Fishermen fully realise the advantages that quick freezing brings and they have willingly made their contribution to the process costs by agreeing to sell sufficient of their catch to keep the quick freezing factories working to capacity at a price substantially below the statutory maximum which, as a general rule, they receive for herring for the home market.

Consumers are less ready to contribute to the extra cost involved in quick freezing, however, largely because of the problem of differentiation between quick frozen and fresh herring.

Much thought has been given to possible solutions to this problem. The most obvious, and one which the Board have favoured heretofore, is the packaging of the herring and their sale in a frozen state from refrigerated display cabinets, which are gradually coming into use in retail shops.

Such packed herring do not readily command an extra price, and the Board have bowed to this attitude on the part of the shopper.

"The situation at the moment is paradoxical," the Board say. "Herring which are frozen during the Scottish summer season, in the prime of condition, have to be sold side by side with the fresh herring which are so plentiful in the markets at that time, because it is not an economic proposition to hold the frozen stocks in cold store until the months of December to March, when few British herring are landed. One of the main attractions to persons proposing to engage in herring freezing is the knowledge that there is a ready market for many thousands of tons of herring in the months of December to March. During these months the market's requirements are at present satisfied almost entirely by means of imports from Norway.

"The possibility of retaining this market for the British producer is frustrated by the hard economic fact that to store herring frozen during the Scottish season and to carry them forward to the months of scarcity costs 1s. 8½d. per stone, of which unavoidable expense of distribution no account is taken when trading margins are fixed under the Maximum Prices Orders.

"The solution advanced by the Board is the payment of increased prices for British-caught herring from December to March and the sale of quick frozen herring at a similar price during that period. This would help to clean out stocks of quick frozen herring and contribute to reserves for later use."

After filling into baskets, the fish is weighed into 7 lb. lots. *Photo Herring Industry Board.*

In this report the Board indicated their rejection of a proposal by the Scottish Council (Development and Industry) for a floating herring freezing factory, but have agreed to keep this possibility under constant survey.

BOOKS RECEIVED

Orders for any of the books listed below or reviewed in this issue may be placed with the Books Department, FOOD MANUFACTURE, *17, Stratford Place, London, W.1. It is regretted that under present conditions it is not always possible to supply books by return of post.*

Outlines of Food Technology. By Harry W. von Loesecke. Second edit. Pp. 585+vii. Reinhold Publishing Corp., New York, and Chapman and Hall, London. Price 60s.

The Practice and Science of Breadmaking

In the second of the three Cantor lectures delivered before the Royal Society of Arts, Dr. D. W. Kent-Jones, Ph.D., B.Sc., F.R.I.C., discusses yeast, the fundamental principles of panary fermentation, enzymic problems, and bread flavour, staling, and diseases.

WHEREAS the old barms tended to be unreliable, requiring considerable attention and skill in their preparation, the baker now normally has at his disposal a regular fermentative agent in modern compressed yeast. This has simplified his problems, but it has also meant that the present-day baker often no longer understands fermentation problems as well as did his forebears.

There now seems little doubt that, if the percentage of yeast in the dough (calculated on the flour) is less than 2 per cent., there is definite multiplication. The smaller the amount of yeast, the longer is the time of fermentation and the more the multiplication. If the amount of yeast is as high as 2 per cent., then there may be only a 30 per cent. increase in the number of yeast cells, but if the amount of yeast is only 0·5 per cent. the increase may approach 100 per cent. In panary fermentation, dough constituents other than sugar are involved in the metabolism of the yeast. Thus in a non-yeasted dough there is a small but definite and progressive increase in amino nitrogen, but there is a decrease in a corresponding yeasted dough. There is clear evidence, therefore, of the assimilation of amino acids by the yeast in panary fermentation.

Amount of Yeast Required

The important practical point for the baker is the amount of yeast he should use, and there is a definite relationship between the amount of yeast and the length of time the dough takes to become "ripe" and ready for the actual baking process. It is only possible to indicate rough figures, since much will depend upon the nature of the flour, the temperature and other conditions in the bakehouse, and the amount of salt used, but the following rules give the usually accepted figures in this connexion. The amount of yeast is based on the fact that for English bread (as opposed to Scottish) the "Twelve Factor" is a reasonably good guide, always assuming that good yeast is employed and the dough made at the appropriate temperature under satisfactory bakery conditions.

The "Twelve Factor"

To determine the yeast required for a one-sack dough by this method, the factor 12 is divided by the total time in hours for which the dough is fermented, that is from the time of leaving the mixer to that of entering the oven. This includes what the baker calls the proving time. Thus a dough taking four hours from mixer to oven will require 3 lb. of yeast. It should be emphasised that the method is no more than an approximate guide to yeast content and is least reliable at the extreme ranges of dough time, that is for very short or very long doughs.

It is not possible to deal in detail with the many fermentation systems used in breadmaking. The fermentation system may be as short as one to four hours or even as long as twelve hours or more. "Straight" doughs can be made, *i.e.* all the flour, yeast, salt, water, etc., added at one time to make the dough, or various "sponge" systems employed. In a sponge system part of the flour and water, and generally all the yeast, are used to make the sponge.

After the sponge, normally made with strong flour, has risen and dropped, it is broken up with the remaining water and the salt to a gruel-like consistency and then the remainder of the flour, often of a soft type, is mixed in to complete the dough. This final dough now requires very little further time for fermentation (usually about one hour) before it is ripe and ready for scaling off. The sponge may be "set" for anything from one hour to twelve hours. Fast sponges are usually made slack and are called "flying sponges." The advantages of the sponge system are that a smaller amount of yeast is required, a good bread output is obtained, and the bread has an attractive flavour. Its disadvantage is that it is a rather more complicated system and not so foolproof as the straight-dough process which is now mostly used.

The best bread is made by fermenting cool doughs, say 75°-80° F., and this may mean the plentiful and generous use of yeast. For attractive and well-flavoured bread most experienced bakers will advocate the comparatively plentiful use of yeast in a cool dough and keeping the salt proportion on the high side. It is normally bad practice to ripen doughs by making excessively warm doughs and restricting the yeast, although the dough can be ripened just as quickly by such practice.

Other Dough Ingredients

Besides the flour, yeast, and water (the salts in the water have an effect on the dough and hence on the bread), the dough always contains common salt, and often other additions, such as malt, sugar, fat, and dried milk, are made. The latter, excellent from the nutritional angle, has rarely been used in Great Britain, especially since the beginning of the last war. The need or usefulness

of malt flour or malt extract is largely dependent on the diastatic activity of the flour, since, although there must be sufficient diastatic activity to produce sufficient gas, excessive diastase will give a crumb which fails to bake out and may be as disadvantageous as too little diastase.

Flours which have excessive diastatic activity convert, in the actual baking, an excessive amount of the starch into gum and this results in a heavy and an unpleasantly sticky crumb.

The modern autolytic method used to evaluate the diastatic activity of flour will usually indicate if a malt addition is necessary or if it is harmful. It is, however, hard to lay down any definite fixed rate, since some bakers may manipulate their doughs so as to use malt for flavour purposes without trouble, while others would encounter difficulties.

Use of Fat

With respect to the use of fat, there is no doubt that 4 lb. or so of fat to the sack is advantageous. It improves the crumb texture and quality, but few bakers today have fat to spare for this purpose and the same applies to the use of sugar. When these materials are more plentiful there is little doubt that many bakers will use them reasonably freely in an effort to improve the quality and the attractiveness of the bread.

It is generally agreed that monoglycerides are sometimes useful in that the inclusion of a small amount, such as 1-2 per cent. of the fat, permits a smaller amount of fat to produce the same result in the loaf and in cakes. Much may depend on the other ingredients, but undoubtedly the use of monoglycerides has come to stay.

Salt and Yeast

On the question of the interrelationships of the proportions of salt and yeast, it is difficult to make attractive bread unless salt is used generously, say about 5 lb. per sack of flour, or, if preferred, at the rate of 5-5½ oz. per gallon of water. Salt helps the flavour and it toughens the gluten. It has the effect, however, of depressing the activity of the yeast, so that the plentiful use of salt also involves generosity in the use of yeast.

When a fermenting dough is formed from the simplest ingredients, namely, flour, yeast, salt, and water, a dough with both plastic and elastic properties is formed, the characteristics of which are of great importance. The dough, when first made, is rather stiff and dead, but, as it rests at a temperature normally in the region of 80° F., it increases in size and becomes livelier and more elastic. The increase in size is due to the presence of gas generated within the dough and the power of the dough itself to retain the gas.

Hand arm mixer with cover and tempering tank.
Photo Morton Machine Co.

This gas is formed by the action of the yeast on sugar and all flour naturally contains fermentable sugar, *i.e.* non-reducing sugar, apparently cane sugar, and reducing sugars, such as maltose. Without the presence of these sugars there would be no gas, since yeast does not ferment starch. The critical stage is that at which the dough no longer is able to retain the majority of the gas evolved in it, and this depends on the amount and nature of the gluten present. If careful gas production and gas retention experiments are made, the point at which the dough starts to lose gas in some doughs is long delayed. With weak flours unsatisfactory for breadmaking, the graphs recording gas production and retention quickly show deviation. Weak flours are reasonably satisfactory for the making of bread only if the panary fermentation system is comparatively short.

It is not possible to bake the dough as soon as it is charged with gas, since at that stage the dough is usually not "ripe" and unripe doughs yield small, quick staling, and unattractive loaves.

It takes time for the dough to attain the correct state of ripeness, depending on the amount of yeast being used. Although the bread relationship between the quantity of yeast, the dough temperature, and the time for the dough to reach ripeness has already been given, much depends on the conditions in the actual bakehouse, and it is essential for the baker to be able to judge ripeness for himself.

Differences in the Dough Stage

Although the difference in the final bread made from correctly ripened and incorrectly ripened doughs is great, the differences in the dough stage are much less marked. The nature of the flour itself will affect the time of ripening as well as atmospheric conditions, character of the water, activity of the yeast, etc.

When the dough is ripe, it then becomes necessary to knock the majority of the gas out of it—as good bread cannot result from baking a dough filled with stale gas. The dough has then to be divided into the desired pieces and finally moulded into the desired shape. It is no use putting these

After the mixing operation, the dough is released into metal-lined troughs.

divided and moulded pieces straight away into the baking oven —the dough must rise again.

It is obvious that the dough can only rise again if gas is produced, which means that sugar must be present, and also that the gas must substantially be retained. The sugar originally present in the flour has by this time been used up and, if there is to be satisfactory gas production at this critical stage, a fresh supply of sugar must be available. This fresh supply is the sugar which has gradually been produced in the dough by the diastatic enzymes present in the dough which have converted some of the starch present into sugar.

In considering the diastatic group of enzymes, it is necessary to differentiate between the two types of diastatic enzymes, namely, α- and β-amylase, both of which are probably combined with activators and inhibitors. In dealing with the diastatic enzymes, flour made from sound and unsprouted wheat mainly contains β-amylase, which can act on gelatinised and also on the "available" starch or "ghost" starch, and the products are now known to be the fermentable sugar, maltose, while there remains a residue (40 per cent.) of dextrins of high molecular weight.

Whether flour milled from sound wheat contains, besides the β-amylase, any α-amylase is not settled, but certainly flour from sprouted wheat is rich in α-amylase. Whether or not α-amylase is present in sound flour, it seems certain that some starch-liquefying enzymes exist and one function of α-amylase is the power of liquefying and dextrinising starch. Some authorities also refer to the presence of a "raw starch amylase," but this has never been clearly distinguished from α-amylase. The main action of α-amylase, however, is to produce dextrins of low molecular weight which cause reduction in viscosity. These dextrins are not coloured by iodine and are therefore distinguished from the residual starchlike dextrins, left by the action of β-amylase, which stain purple with iodine.

Changes in the Dough

It is generally believed that in panary fermentation the production of the fresh sugar in the dough, so essential at the critical end period of proving time, only comes from the action of the complex amylase group on the "available" starch, since the rate of sugar production from undamaged starch is too slow to affect commercial doughs. Besides the changes which take place in the dough, the important period of the early baking stages must also be considered.

At a pH of about 5·5 which is reached by the dough, α-amylase is rapidly destroyed at high temperatures, but the problem is complicated if there is adequate calcium-ion concentration. It seems likely that in practice α-amylase may still be active in doughs up to a temperature of 70° C., and it is in the oven that much of the damaging action of α amylase occurs.

The changes noticeable in a dough rich in α-amylase, *e.g.* one made from a flour produced from sprouted wheat, are not pronounced, but, after baking, the crumb (due to the presence of excessive low molecular weight dextrins) is sticky and dark heavy streaks may be visible.

Enzymes in Dough

Some β-amylase and possibly some α-amylase or similar activity in dough is essential for the replacement of the naturally occurring sugars which tend to be used up in the early stages of panary fermentation; there is no doubt that excessive α-amylase is harm-

ful to the production of acceptable and properly baked bread. Further, it is unfortunate for the baker that no obvious remedy is known when the flour has excessive α-amylase. While β-amylase is said to be inactivated by heating at 70° C. for fifteen minutes, the normally accepted method of inhibiting α-amylase is subjecting it to a pH of 3·3 at 0° C. for fifteen minutes.

A dough also contains members of the group of enzymes known as the esterases. Mention should be made of the lipolytic enzymes which split oils and fats and set free fatty acids. Although traces of what are called the saturated fatty acids seem, in general, to have little effect on doughs, unsaturated fatty acids especially when oxidised may have a detrimental effect on the loaf.

Phytase in Flour and Yeast

The enzyme phytase in the flour and also the phytase in the yeast do appreciably hydrolyse the phytin in a dough. Thus in a short fermentation system with a relatively large proportion of yeast (up to 2 per cent. calculated on the weight of the flour) it has been suggested that over 50 per cent. of the phytic acid phosphorus would be hydrolysed and that half of this hydrolysis comes from the phytase in the flour and the other half from the phytase in the yeast. In longer systems, when less yeast is used, most of the hydrolysis brought about by the phytase is due to the phytase in the flour itself.

Doughs also contain representatives of that group of enzymes known as proteases, using this term in the broad sense to indicate an enzyme capable of splitting up proteins and hence of affecting the character of the real skeleton structure of the dough, namely the substance distinctive of wheaten flour, the gluten. It is common knowledge that freshly milled flour does not have the same ability to produce pleasing bold loaves as flour which has "aged." This improved baking effect is now brought about almost immediately by the treatment of the flour with what are known as "improvers." These are chemical substances such as potassium bromate, ammonium persulphate, chlorine, nitrogen trichloride, or chlorine dioxide, which, when used in "trace" quantities, such as 1 in 100,000, bring about the desired result.

Chemical Additions to Flour

One of the main functions of these chemical additions to flour is partially to inactivate proteolytic activity, which may often be excessive. This inactivation is considered by some to be due to the oxidation of the activators of the proteases and, in this respect, considerable investigations have been made in connexion with glutathione. It should be stated that the "protease theory" with respect to the action of improvers does not seem to fit in with all the known facts and is not accepted by certain workers. Although, as expressed today, it may not be correct in every detail, yet in general it is gaining acceptance in a wide sense.

Other enzymes exist in fermenting doughs such as catalase, peroxidase, tyrosinase, and others connected with the oxidation-reduction systems which involve the sulphydryl grouping.

It is hoped that further work will throw more light on the nature of that unsolved but important question of dough ripeness and the associated problem of fermentation tolerance, which is the ability of flour to make good bread over a fairly wide range of dough ripeness.

Bread Flavour and Staling

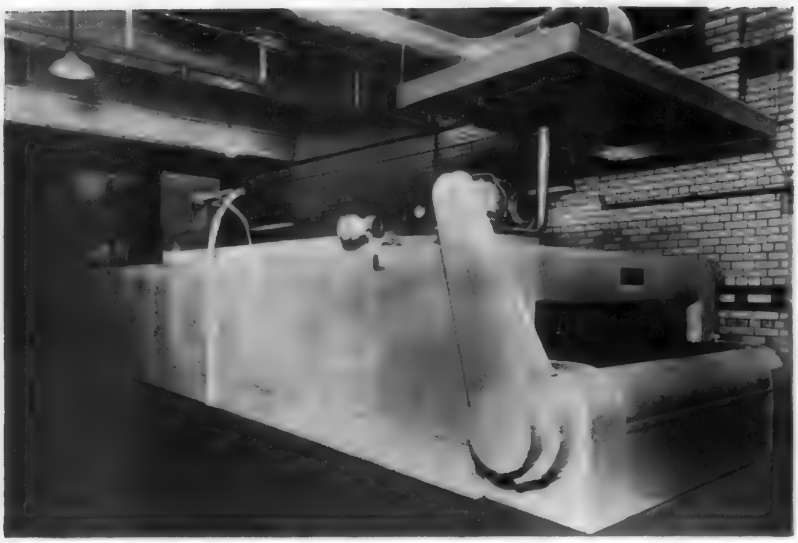
Bread flavour, which is important, is affected by many factors, such as character of the flour, the percentage of crust to crumb, correct fermentation, plentiful use of salt, and yeast in well-fermented cool doughs. Since it is not possible to make accurate assessments or measurements of flavour, the whole question is necessarily vague. Certain types of Scottish bread made on a very long fermentation system have a distinctive flavour which is regarded as rather too acid in other parts of the country. Bread from low-grade flour is more pronounced in flavour than that made from very white patent flour, but is not universally preferred. So far what might be called the chemical theories with respect to flavour have not been proved, such as the suggestion that the presence of traces of diacetyl is associated with flavour. It may well be that real bread flavours are fleeting in character and some type of polymerisation may account for the rapid loss of flavour as bread ages.

All bread stales, but bread made from doughs not correctly fermented, such as under-ripe or over-ripe doughs, from doughs made too tight or too slack, or from doughs lacking vigorous fermentation from a number of causes, stales unduly quickly. Staling is not just loss of moisture; staling and development of harshness of crumb can take place even without loss of moisture. Staling is obviously closely connected with the conditions of the partly gelatinised starch in the loaf.

Causes of Staling

Modern research has interested itself in investigating which portion of starch, the straight-chain amylose or the branch-chain amylopectin, is mainly responsible. Certain "waxy" starches, *i.e.* starches such as those from maize, are composed almost entirely of branched-chain amylopectin; nevertheless bread containing essentially all the starch in the form of amylopectin still stales or hardens on storage. Yet some authorities still believe that staling is related to the gradual insolubilisation (coacervation) of amylopectin.

There is also evidence that staling may be connected with the question of hydrogen bondage and may be more concerned with the amylose (straight-chain) fraction than with the branched-chain amylopectin fraction. There is a definite feeling now that a polymerisation change takes place in the partially gelatinised starch gel, possibly *via* the secondary valency of the hydrogen bond, and it may be that the methods now used to investigate hydrogen bondage may throw some light on staling.



Electric travelling oven of the straight-through sole-plate type.
Photo The General Electric Co.

It is claimed that staling can be prevented by the addition to the dough of such substances as acetaldehyde or pyridine. In the U.S. good practical results have been obtained by the use of preparations such as polyoxyethylene stearate, but doubts have been expressed as to the possible toxicity of such compounds. Until there is no possible doubt that there can be no ill-effects the use of such compounds should obviously not be permitted.

Bread Diseases

Among bread diseases are mould spoilage and "rope." Bread is such a rich and such an excellent medium for growth that moulds are apt to grow on it quite rapidly unless precautions are taken. Moulds are not, in general, harmful, but make bread unpleasant and unattractive. It should, however, be realised that moulds on bread come generally from external sources, since there is a high degree of sterilisation in baking, and much depends on how the bread is stored and the weather conditions which prevail.

This matter presents a more serious problem in certain warm climates, but cooling down bread in any atmosphere likely to be heavily laden with mould fragments, etc., is undesirable. Trouble from bread becoming mouldy unduly quickly can arise from the presence of a nearby dung heap or from a mass of rotting vegetative refuse. Cleanliness in the bakery, especially in the cooling rooms and racks, and in the delivery carts, is a matter which sometimes leaves much to be desired.

Rope Spores

Rope is a bacterial disease due to the development in the bread of *Bacillus mesentericus* and allied strains of bacteria. It exists in air, soil, and water and, whatever steps the miller takes in cleaning the wheat and in milling under hygienic conditions, flour always contains some rope spores. Whether bread exhibits signs of rope sufficient to be unpleasant, however, depends in the main on how the bread is cooled and stored. In the baking process the vegetative form of the *mesentericus* is killed, but the spore forms can survive. These do no harm and all bread contains some spore forms of *mesentericus*.

Conditions Causing Rope

The practical trouble only commences when conditions are such that the spore form reverts to the vegetative form and multiplies. This only happens if the weather is hot and moist. Rope is, therefore, more troublesome in hot countries than in Great Britain, but it does occasionally cause difficulties in really hot periods in summer, when the bread remains warm too long and the bacteria multiply. The first signs are that the crumb of the loaf acquires a sweetish and fruity smell. If unchecked, the crumb darkens and becomes unpleasantly sticky and the odour more pronounced until it is most objectionable. Thorough cleaning out of the bakehouse is called for, including lime-washing walls, and removing all scraps of dough in troughs and elsewhere which may be sources of pronounced infection. Bread must be cooled down more rapidly and this often means less close stacking when cooling.

Acid Treatment

B. mesentericus cannot survive in acids and a *p*H of 5·0 is sufficient to prevent the bacteria from living. Troughs, etc., should therefore be scrubbed out with vinegar or a 5 per cent. solution of acetic acid. A pint or so of vinegar should be used in making doughs while the weather remains hot. Other acid ingredients can be incorporated in dough-making such as 1-2 lb. per sack of acid calcium phosphate, sodium acid pyrophosphate, or calcium acetate. It is also helpful to ensure that the dough ferments vigorously.

Future Research

Although there have been valuable advances, much remains to be done and it is encouraging that at long last there has been formed a Baking Industries Research Association. For centuries baking has been conducted on very much the same lines; indeed, much work awaits the Research Association. The production of good, pleasing, and attractive bread of good flavour, good keeping quality, and high nutritive value is a matter of the greatest importance, especially so since it still comprises the principal article in the diet of many millions of people.

TO AUTHORS

FOOD MANUFACTURE is prepared to consider the publication of any books on scientific and technical subjects which authors might care to submit.

The main entrance, St. James's Gate Brewery, Dublin.

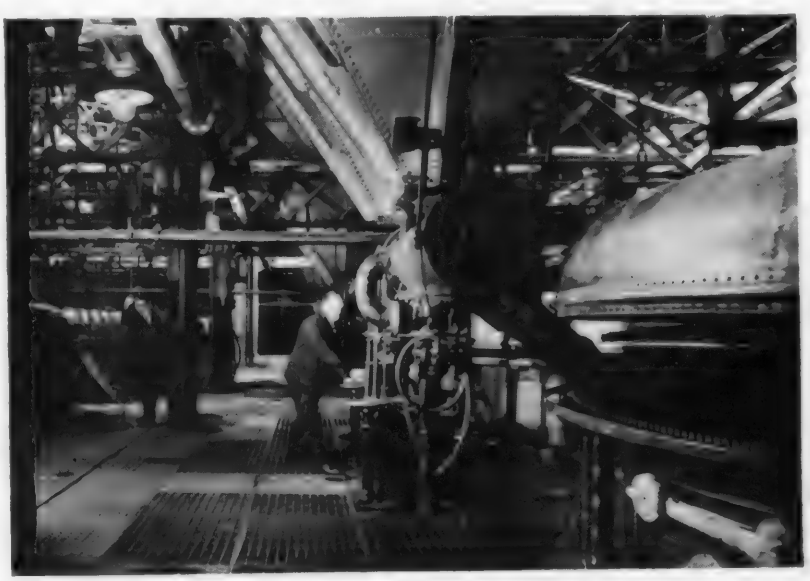
Two Centuries of Brewing

Long years of experience and the skill of bygone brewers go into every bottle of Guinness and govern its characteristic flavour. Arthur Guinness founded the business in 1759, and established his brewery at St. James's Gate, Dublin, the site of a brewery since 1670, leasing it for 9,000 years. Since then millions of gallons of stout have flowed through its pipes, and today the brewery is one of the largest in the world.

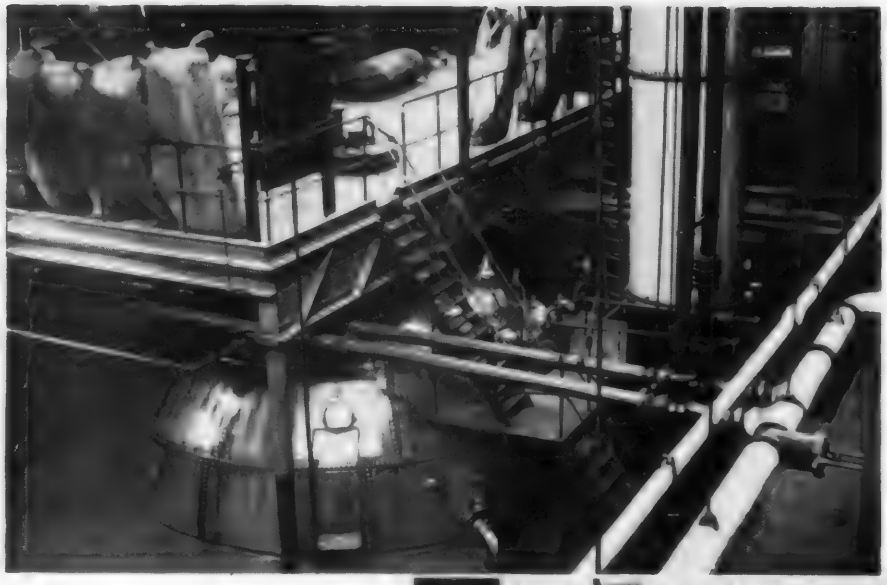
IT IS probable that ale and table beer originally formed the brewery's sole products; but about 1775 porter and stout were added, and became so popular that some time later Guinness discontinued the brewing of ale.

The ingredients of Guinness are malt, hops, and water. Thousands of acres of barley are grown annually in Ireland to supply the malt, but as home production falls short of the enormous quantity required, barley from England and elsewhere is also used. Most of the hops come from English hop-fields—including some owned by the company near the Kent/Sussex border.

The water used for brewing is drawn from springs that feed the upper levels of the Grand Canal in County Kildare.



Inside the mash tuns the ground malt is mixed with hot water and converted into wort which is drawn off through slotted plates.



Left: **Hops are added to the wort liquor with a small quantity of roasted barley and boiled for several hours in coppers. In the brewery there are a large number of these coppers working simultaneously, the hops being fed into them from an overhead gallery.**

Below: **Fermenting takes place in massive tuns wherein the brew, with a small amount of yeast, is allowed to stand for two or three days.**

The brewing of the ingredients of Guinness' Stout remains basically the same as it was in the eighteenth century, and is effected in two main stages:

(*a*) Mashing, in which the malt is boiled in water to make an extract.

(*b*) Boiling, when hops are added to the malt liquor (called wort) to give the brew its flavour.

The Mashing Process

Ground malt for mashing is loaded overnight into huge hoppers which feed the mash tuns and, in the early morning, is dropped into cylinders above these tuns, where it meets an ascending stream of hot water. Inside these cylinders, rakes revolving at high speed mix the malt and water together until the mixture reaches a porridge-like consistency, when it is poured into the tuns.

The mash tuns are also equipped with rakes (for further mixing and levelling the malt) which, in this case, are called "the carriage" because they travel round the rim on wheels.

When mixing is completed, the wort is drawn off through slotted plates forming a false floor in each tun, into the holding vessels (called underbacks) below. Simultaneously, hot water is sprinkled on top of the malt remaining in the tuns, and the whole process repeated continuously for about ten hours. At the end of this time all the water-soluble constituents have been extracted from the malt, and the remaining solids are later sold for cattle food.

Boiling Operation

At the boiling or copper stage the wort liquor is pumped from the underbacks into vast coppers, where hops are added to it and the mixture boiled for several hours, following which it is run into hop backs. These are large circular vessels fitted with a false floor designed to retain the hops and allow the liquor to flow through into the tanks below.

During boiling, a small quantity of roasted barley is added to the liquor to give the brew its dark colouring, a process which goes right back to its origin, as it is said that Guinness got its colour because Arthur Guinness (who was agent to a bishop) inadvertently burnt the barley for the table beer, with the result that the brew was nearly black instead of light brown. Nevertheless, the bishop liked it better than all previous brews, and thus Guinness was born.

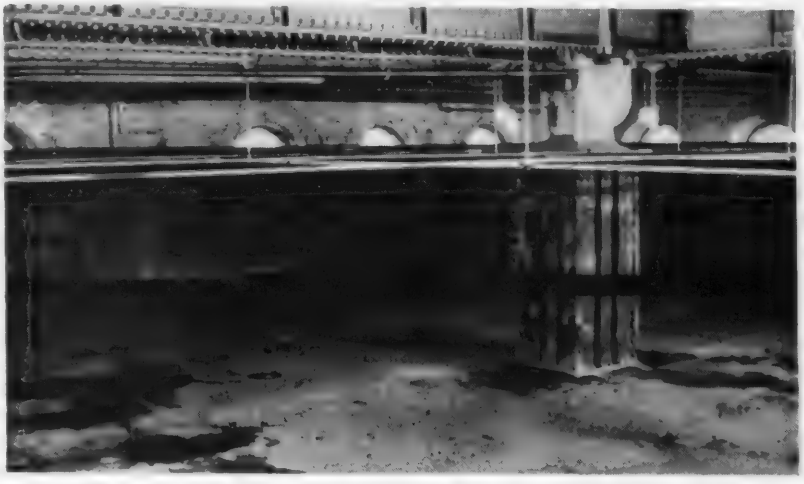
Fermenting the Brew

The actual brewing process is completed after boiling, but before the brew becomes an alcoholic beverage it must be fermented. Following cooling, it is run into further tuns, where a small amount

The fermented liquor is run into special tanks known as skimmers where the surplus yeast is skimmed from its surface by means of a board running across the whole width of the tank.

of yeast is added, and the liquor allowed to stand for two or three days. During this time most of its malt sugar, formed in the mashing process, is decomposed by the action of the yeast which produces alcohol and carbonic acid gas. On the third day this yeast, which has reproduced itself many times, is removed. For this purpose the fermented wort is run into special tanks, known as skimmers, where the surplus yeast is skimmed from the surface by a board, a small quantity being kept for the next brew, and the remainder dried for cattle food.

The fermented liquor is then pumped into large settling tanks, whence it is later transferred to vats, each holding up to 90,000 gallons, and stored for various periods according to its grade and intended market. For instance, Foreign Extra Stout—for consumption in tropical climates—has to be matured longer than any other grade before it is exported, whereas the ordinary brew for sale in Ireland matures very quickly.



The finished product is pumped into large settling tanks where it remains for a short period before being transferred to the vats.

Racking and Despatch

When sufficiently matured, the stout is delivered by pipeline from the vats to the cask filling units, called "racking" machines. Casks of various capacities, namely firkins (8 gallons), kilderkins (16 gallons), barrels (32 gallons), and hogsheads (52 gallons) are auto-

When sufficiently matured, the stout is conveyed by pipeline from the vats to the racking machines prior to despatch.

Inside the caskmaking shop where new casks are constructed and used ones reconditioned before being put back into service.

matically filled then sealed by wooden bungs and rolled down rails to the despatch docks, where they are loaded on to river, rail, or road vehicles for delivery to all parts of the world. Those for overseas shipment are taken by barge or road transport to the Customs House Quay on the Liffey, and there transferred into the three cross-channel steamers owned by the company, or into vessels of the various lines sailing from Dublin. Lighters and barges convey consignments sent by canal to central Ireland; principal Irish railways are connected with the brewery by a railway line running through its yard, and waggons are loaded at sidings inside the brewery premises.

Guinness' Stout is not bottled at the brewery as in Ireland it is customary to deliver it in casks to bottlers all over the country. Thus, caskmaking and cask renovation form an important ancillary part of the brewery's activities. Since all casks must be in perfect condition when they are filled, a staff of expert craftsmen is kept fully occupied with this work.

Staff Welfare

The health of nearly four thousand people employed in the brewery is amply safeguarded. Prospective employees are given a medical examination before they are accepted, and thereafter looked after by the firm's medical service, which is one of the finest in the world.

The medical department forms a self-contained unit housed adjacent to the brewery in a building of its own, which consists of two dispensaries, dental and X-ray departments, physiotherapy clinic, and a pharmacy. All are provided with the most up-to-date equipment, which, in the physiotherapy clinic, includes apparatus for massage, radiant heat, and electrical treatment under medical supervision. Three doctors attend the dispensary daily (one residing on the premises) and all visit their patients at home when necessary. In addition, two dental surgeons, two trained nurses, two qualified pharmaceutical chemists, a welfare superintendent, and a masseuse staff this department. Clinics are held each morning, from 9 a.m. to 12 noon, treatment is available at any time of the day, and prescriptions are made up before the patient leaves the dispensary.

The company also maintains eight beds in sanatoria in the country for patients suffering from tuberculosis, obtains beds in hospitals and convalescent homes, and makes arrangements for pathological reports; radiological examinations, deep X-ray therapy, and radium treatments are also undertaken, in addition to the supply of orthopaedic and other appliances. All this is free to Guinness' employees and their dependents, who do not contribute towards the cost of any treatment, paying only for dentures, which are supplied on an easy payment system by means of loans.

As a result of the firm's efforts to protect the health of their staff by these and other means, the employee illness ratio is low, while absenteeism is practically unknown. Without doubt it is this care of the people who brew Guinness' Stout, or otherwise contribute to its production, as much as the actual brewing process itself, that maintains the high output and quality of this product.

A small section of the physiotherapy clinic, the whole of which is equipped with the most up-to-date electrical apparatus.

Food and Health in Britain

The report of the British Medical Association's Special Committee on Nutrition, of which this article is an abstract, is a summary of its work since October, 1947, when, under the chairmanship of Lord Horder, it was set up "to examine the whole question of nutrition in this country and prepare an authoritative report with particular reference to the adequacy or inadequacy of the war-time and post-war diet."

THE Committee delegated its main work to four sub-committees which dealt with nutritional requirements, actual food consumption, the clinical assessment of the nation's health in terms of nutrition, and the psychological and practical aspects of nutrition.

Nutritional Requirements

While accepting as a basis for consideration of the needs of adults the estimates of 2,200 and 1,800 Calories a day for males and females respectively, the Committee objected to the classification into "light," "heavy," and other rough-and-ready designations of physical activity. As the present data available were not sufficient to enable the production of a list of industrial occupations for each of which an appropriate average calorie assessment could be assigned, these designations were accepted, and the Committee took the additional calories per hour for various grades of work from sedentary to very heavy effort from 30 to 300 and for exceptional heavy effort in the case of males to 450.

A thorough study of the relation of the distribution of the daily calorie intake to working efficiency, particularly in "heavy" industries, would, in the Committee's view, reveal much of practical importance.

Fat in the Diet

On the subject of fat in the diet, the Committee was inclined to accept the view that the relatively simple type of diet that had been enforced in Great Britain by war-time and post-war restrictions had provided all that was required in the form of "essential fatty acids" if, in fact, they are of importance to human nutrition. It found ample support for the opinion that fat ("visible" and "invisible") should provide at least 25 per cent. of the calorie value of the diet in order to maintain the general character of the food habits of the people of the United Kingdom. If the diet were not to become bulky and unsatisfying, it would be appropriate to increase this proportion to about 35 per cent. as the energy demands of the body rose with increasing physical effort.

In its critical analysis of the evidence regarding man's need for protein, the Committee based its recommendations on the evidence indicating that growth and health were on the whole well sustained between 1940 and 1945. During this period, the energy derived from protein generally represented between 10 and 14 per cent. of the total calories.

B.M.A. Recommendations

After careful consideration it was agreed that there were not yet sufficient quantitative data regarding maintenance of good calcium balances on relatively low intakes to justify a departure from the National Research Council (1945) recommended allowances of calcium. The recommended allowances for iron were also thought to be appropriate.

In its review of vitamin requirements, the Committee was unable to find any trustworthy evidence that maintenance of saturation of the blood with vitamin C was desirable in the interest of health and was of the opinion that while 20 mg. a day or even less might be an adequate quantity for adults, 30 mg. daily would provide a good margin of safety.

According to the estimates put forward in the report, the following are the *per capita* requirements of the U.K. 1948 population:

	B.M.A. Recommendations 1949.
Calories	2,554
Protein (g.)	71
Calcium (mg.) ..	917
Iron (mg.)	11·8
Vitamin A (i.u.) (mixed diet)	4,570
Thiamine (mg.) ..	1·02
Riboflavin (mg.) ..	1·53
Niacin (mg.)	10·2
Vitamin C (mg.) ..	20-30
Vitamin D (i.u.) ..	150

Food Consumption

Information on the question of the present food consumption of the people of the United Kingdom was derived from estimates of the total amounts of food consumed by the population and from the results of family and individual surveys.

The level of consumption of dairy products (excluding butter) in 1947—the latest year to which generally the statistics given in the report relate—was 30 per cent. above the pre-war level. The consumption of butter was 56 per cent. below the pre-war figure, its place being taken by margarine, the consumption of which was up by 70 per cent. The consumption of meat in 1946-47 was 9 per cent. below pre-war level, calculated by carcass weight, or 15 per cent. calculated by edible weight, but there was greater variation between the different types of meat. Mutton and lamb, for example, were 10 per cent. above pre-war consumption, while pig meat was 83 per cent. below. Fish, poultry, and game were in 1946-47 consumed to 28 per cent. above pre-war level, and eggs were 14 per cent. below. Sugar was 26 per cent. down, and all fruit 18 per cent. down, while vegetables increased by 8 per cent., potatoes

by 67 per cent., and grain products by 10 per cent.

The average intake of calories was lowest in the first two years of the war and highest in 1944. After that year it declined slightly and in 1946-47 stood at 97 per cent. of the pre-war figure.

Comparisons with Pre-war Diet

Total supplies of protein have shown a gradual increase to 112-3 per cent. in 1945-47, falling, however, by 1 per cent. in the last year. The gain has been made principally in vegetable protein. The intake of animal protein, which had remained consistently below the pre-war level during the war years, has risen each year since 1943 until it reached 6 per cent. above the pre-war level in 1946-47.

There has been a marked decrease in the fat content of the diet, the decrease varying between 13 per cent. and 5 per cent. during the war.

Since 1945 a further decrease has taken place to 15 per cent. below the pre-war level in 1946-47. *Per capita* supplies of carbohydrate remained slightly below the pre-war level for most of the war, but since 1944 have been 1-3 per cent. higher.

The mineral content of the diet has shown a marked improvement since the beginning of the war. In 1943 calcium intake, mainly as a result of the inclusion of calcium in flour for breadmaking, was 49 per cent. above the pre-war level, and iron intake was 28 per cent. above; by 1946-47 the corresponding figures were respectively 63 per cent. and 43 per cent. above.

The average daily intake of ascorbic acid, after falling very substantially in the early part of the war, was by 1946 almost up to pre-war level, and the average intake of vitamin A was only 5 per cent. below.

Much misunderstanding has arisen and many wrong conclusions have been drawn from comparison of the results of family food surveys made at different times. The complexities of the subject can be illustrated by the recent controversy as to whether or not the nation is worse fed after the war than were the unemployed before the war.

A study of the surveys indicates that people in the various groups got enough calories during the war years. Judged by the League of Nations standards, the average consumptions of calories and proteins were adequate.

The main changes in food habits in nutrients supplied were increase in consumption of cereals and potatoes, and reduction in that of animal protein, fats, and vitamin C. The fall in animal protein was probably of little nutritional significance but reduced the palatability of the diet.

The principal evidence of the relation of diet to income during the war years was found in the survey of the diets of children in industrial towns in 1943-44. According to this survey, the diet improved with increasing expenditure on food; but there was, on the average, little variation with changes in the size of the family except that the larger the family the smaller was the intake of vitamin A and ascorbic acid, and that in big families the proportion receiving adequate calcium was less.

A further result of the surveys was to suggest that after the end of the war the difficulties facing housewives in obtaining a sufficient and appetising diet for their families were increased, owing not so much to an actual shortage of food as to an insufficiency of the more palatable foods. Those especially affected were families who could not afford to spend much on food and those groups of the population, such as adults, who had high calorie needs.

Food Control

The most important features of the system of food control fell into two groups: those which affected the availability of the foods and nutrient supplies of the whole nation, such as rationing, food price control, the raising of the rate of extraction of flour, the addition of calcium to bread, and the fortification of margarine with vitamins; and those which were directed to improving the food intake of certain classes of the population according to their special nutritional needs. Among the latter were the control and distribution of milk, the extension of communal feeding, the vitamin schemes, and the special food allowances to expectant mothers.

The picture emerging from the studies of food consumption levels was that the character of the nation's diet had changed considerably since the beginning of the war, but that the supplies of many foods, particularly those of animal origin, had not been reduced as much as was commonly believed by some sections of the population. While during the years 1940 and 1941 the calorie supplies fell, the supplies of most of the essential nutrients in the national diet had undoubtedly increased.

Some Underfeeding during the War

There seems little doubt that in both 1941 and 1943 there was some underfeeding and unequal consumption of the more palatable and expensive foods by the different sections of the population.

The indirect evidence derived from consideration of the system of food control was somewhat difficult to assess in quantitative terms. Certain details of that system must themselves have done much to improve the general standard of nutrition. The extension of rationing to cover more and more of the food supplies had meant that consumption of the available foods had become more and more equal, although at least up to 1943 it was still unequal for many foods.

The conclusion which the Committee reached from the information available was that since 1939 the diet of the nation had, on the average, deteriorated in variety and palatability, but that supplies of calories had been well maintained and those of most nutrients had increased. In spite of the large amount of data which the Committee considered, direct information about the consumption of food by different groups was disappointingly scanty, and it was not possible to determine with any certainty what degree of underfeeding, if any, there had been in the population.

Clinical Assessment

Evidence as to the effects of war-time diet on health was sought from four main sources:

1. Statistics of mortality and morbidity.
2. Data on growth and development.
3. Clinical data (including radiological information).
4. Biochemical data (including measurements of dark-adaptation).

It could be argued that since 1939 there had been a deterioration in many environmental factors which might have been responsible for an increase in mortality, an increase which, in fact, did not occur because of the beneficial results of an improved diet. On the other hand, over recent years there had been improvements in methods of clinical treatment and a growing understanding in the practice of hygiene and welfare which had gradually spread to all sections of the population with good effects on mortality rates.

Because of the complex nature of the many factors involved the Committee did not find it possible to say to what extent, if any, the war-time improvement in mortality rates had been due to changes in diet.

Physique of Children

Taken as a whole, the information on growth rates of the children of various social classes of the population suggested that physique was maintained or improved during the war years, perhaps with the exception of 1941, but tended to fall back in the years 1945-47.

For a true estimate of the rate of improvement in the physique of children since 1939, comparison should be made between the actual heights and weights attained and those which might have been expected had the pre-war trends continued. In their report the Committee emphasised that the data available were patchy, and regret was expressed that the results of the body weight survey of the Ministry of Food had not been published or made available.

The series of rapid clinical surveys for the assessment of nutrition started in 1942 by the Ministry of Health revealed that the proportions in the different grades changed little in the four and a half years under review.

In the summary of findings relating to the clinical assessment of the nation's health in terms of nutrition, the Committee was of the opinion that the health of the population as a whole, despite the trials and tribulations of recent years, had been well maintained.

Psychological and Practical Aspects

The Committee discussed the difficulties resulting from the inevitable food shortages of the war and post-war years in the section of the report covering the psychological and practical aspects of nutrition. Reports obtained from the W.V.S. indicated that, especially for families who could not obtain meals out, there was difficulty in securing sufficient unrationed food to provide, with the rations, really adequate meals. The restricted supplies of fat were said to constitute a serious problem; there were also complaints of insufficient milk, shortage of sausages, and poor quality of some meat and offal. Waiting in queues contributed to the fatigue and irritation of those responsible for family catering and the monotony of diet resulting from the restricted choice of foodstuffs had added to the unattractiveness of meals.

On the subject of changing food habits, the Committee considered that attention in the first instance should be concentrated mainly upon the age-group fifteen to twenty-five years. This group includes the parents of the future, and any change in its tastes and habits was bound to have its effect upon the coming generation. It had also been influenced by the growth of the school meals and school milk services; a study of it should reveal how far these services had had an effect on tastes. Finally, this particular age group had matured in a period of shortages and to some extent under conditions of army life.

It was suggested in the report that there was a field for enquiry by experienced workers into fundamental changes in food habits which might have occurred among young people as a result of war-time and post-war diet.

To conclude the report, the Committee listed a series of specific recommendations which can be summarised as follows:

1. Enquiries should be instituted with a view to obtaining more detailed information concerning the range of individual energy requirements.

2. A comprehensive study should be undertaken of the relation of the distribution of the day's calorie intake to efficiency of work, particularly in the heavy industries.

3. The provision by the appropriate authorities of machinery for ascertaining at regular intervals the consumption of food by groups and individuals representing as widely as possible the different sections and classes of the population.

4. Reliable methods should be devised for assessing by clinical (including anthropometric and biochemical) procedures the state of nutrition of the population.

5. The desirability of increasing the supply and variety of foods, and of removing all restrictions on the purchase of food as soon as this can be done without detriment to the nutrition of any section of the world population.

6. The appropriate Government authorities should consider the advisability of:

(*a*) Providing the priority allocation of food (especially of milk) free of charge for consumption by school children in their own homes during the school holiday periods.

(*b*) Making practicable arrangements to supply additional allowances of food for consumption at home by those industrial workers to whom works canteen or similar services are not available.

(*c*) Promoting a meals delivery service for old people.

(*d*) Improving hospital catering.

(*e*) Arranging for prospective teachers of domestic science in schools to be made well acquainted during their training with the home background of the ordinary pupil.

(*f*) Instituting an enquiry into any fundamental changes in food habits which may have occurred among people aged 15 to 25 as a result of the diet of recent years.

Ministry of Food

LATEST STATUTORY INSTRUMENTS

The list given below is the continuation of the list of Instruments published in "Food Manufacture," March 1, 1950, page 108.

No.	*Date 1950*	
		PRICE FIXATION
96	Jan. 29.	Order amending the Cheese (Control and Maximum Prices) Order, 1948.
129	,, 29.	Order amending the Biscuits (Licensing and Control) Order, 1943, and the Biscuits (Maximum Retail Prices) Order, 1948.
195	Feb. 13.	Order amending the Feedingstuffs (Prices) Order, 1949. Revokes S.I. 1949, No. 2009.
279	Mar. 2.	Order amending the Cheese (Control and Maximum Prices) Order, 1948.
317	,, 11.	Order amending the Cheese (Control and Maximum Prices) Order, 1948.
318	,, 27.	Order amending the Meat (Maximum Retail Prices) (Northern Ireland) Order, 1949.
319	,, 27.	Order amending the Meat (Maximum Retail Prices) Order, 1949.
		CHOCOLATE, SUGAR CONFECTIONERY, AND COCOA PRODUCTS
190	Feb. 26.	Order amending the Chocolate, Sugar Confectionery, and Cocoa Products Order, 1949.
		EGGS
327	Mar. 12.	Order amending the Eggs (Great Britain) Order, 1949. Revokes S.I. 1949, No. 1377.
326	,, 19.	Order amending the Eggs (Great Britain) Order, 1949, and the Eggs (Northern Ireland) Order, 1949.
		FEEDINGSTUFFS
187	Feb. 1.	The Feedingstuffs (National Pigeon Mixture) (General Licence) Order, 1950.
188	,, 1.	The Feedingstuffs (Licensing) Order, 1950. Revokes S.R. & O., 1948, Nos. 1500 and 1501; 1947, No. 716; 1949, Nos. 1021 and 1588.
189	,, 1.	The Feedingstuffs (Licensing) (General Licence) Order, 1950.
		FRESH FRUIT AND VEGETABLES
	1949	
2437	Dec. 31.	Order revoking the Fresh Fruit and Vegetables (Restriction on Dealings) Order, 1945.
		FRUIT
	1950	
879	Mar. 21.	Order amending the Citrus Fruit Order, 1945. Revokes S.R. & O. 1945, No. 1404; S.R. & O. 1946, Nos. 133 and 1592; S.R. & O. 1947, Nos. 11 and 2558; S.I. 1948, No. 2229; S.I. 1949, No. 2433.
		FLOUR
126	Feb. 1.	Order amending the Flour Order, 1947.
		IMPORTED DECIDUOUS FRUIT
	1949	
2386	Dec. 30.	The Imported Deciduous Fruit (General Licence No. 2) Order, 1949.
2438	,, 31.	Order amending the Imported Deciduous Fruit Order, 1947.
		MEAT
	1950	
281	Mar. 5.	The Meat Feedingstuffs, Venison, Goat Meat and Horseflesh (Revocation) Order, 1950. Revokes S.I. 1948, No. 2264; S.R. & O. 1942, No. 1426; S.R. & O. 1941, Nos. 1851 and 1862.
		NUT KERNELS
280	Mar. 8.	Order amending the Nut Kernels Order, 1947. Revokes S.I. 1948, No. 692.
		PERSONAL POINTS
270	Feb. 26.	Order amending the Rationing (Personal Points) Order, 1949. Revokes S.I. 1950, No. 127.
		POINTS RATIONING
269	Feb. 26.	Order amending the Food (Points Rationing) Order, 1949.
		POTATOES
2436	Jan. 1.	Order amending the Ware Potatoes (1949 Crop) (No. 2) Order, 1949.
248	Feb. 22.	Order amending the Ware Potatoes (1949 Crop) (No. 2) Order, 1949. Revokes S.I. 1949, Nos. 2134 and 2436.
		RATIONING
2422	Jan. 1.	Order amending the Rationing (Personal Points) Order, 1949.
125	,, 29.	Order amending the Bacon (Rationing) Order, 1949.
127	,, 29.	Order amending the Rationing (Personal Points) Order, 1949.
		RYE AND RYE PRODUCTS
2406	Jan. 1.	Order revoking the Rye (Control of Mills and Products) Order, 1942.
		SUGAR
2405	Jan. 1.	The Sugar (Rationing) (No. 2) Order, 1949. Revokes S.I. 1949, Nos. 953, 1496, 1561, 1901, and 2047.

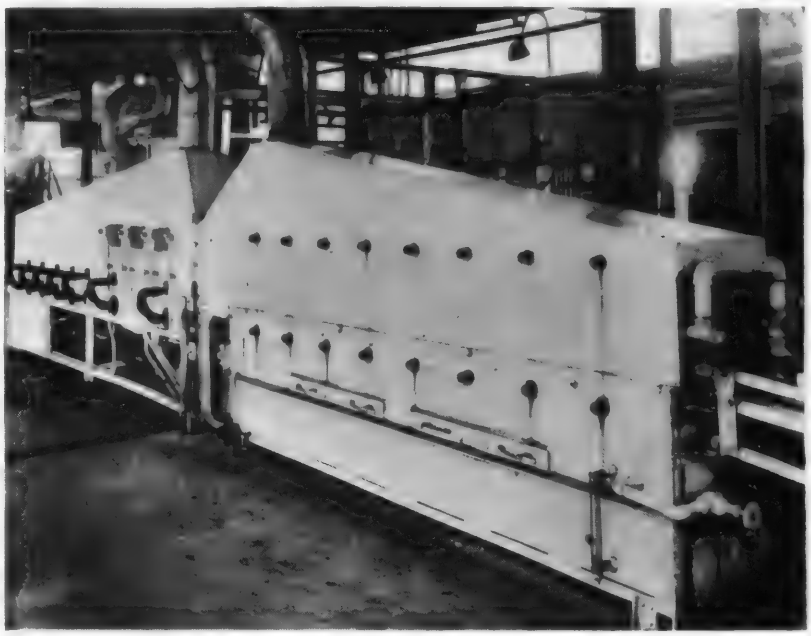
Efficient Operation of Drying Plant

Part III

LEO WALTER, A.M.I.Mech.E., A.M.I.Plant E.

In this instalment are discussed the fundamental principles of hot air drying and also heat losses incurred during the operation of continuous driers.

STANDBY losses of continuous driers, using conveyor belts or other means for moving the material through the apparatus, can be considerable. Driers consume heat and steam, unless heat input is shut off by the plant operator if stoppages occur. To leave steam on full bore during these breaks means waste of fuel and money. During lunch hour the proper closing of steam supply valves to all idle consumers of steam should be ensured. The issue of precise instructions to operators of drying apparatus and hot platen presses will assist in the reduction of heat losses from this source.



Hot air tunnel drying plant.
Photo Davidson and Co.

Causes of Heat Losses

Heat losses during heating-up when starting a machine from cold are inevitable, but they can be reduced by shortening heating-up time.

All such heating-up and standby heat losses should be carefully investigated; the provision of a time schedule, to which foremen and operators have to adhere, will be found of value.

Heat losses from driers can be caused by insufficient insulation of heated surfaces, which are not used to transfer heat for a useful purpose, *e.g.* walls of driers, casings of heater batteries, air ducts conveying hot air into drying rooms, or end surfaces of heated rollers or cylinders. Much can be done to improve thermal efficiency by better lagging of drying apparatus and of pipework, including flanges and valves. Efficient lagging is necessary for high temperature drying stoves, where heat losses through unlagged drier walls to the room are comparatively big, compared with the useful heat within the drier.

Another source of continuous heat losses is air leakage. Where exhaust fans are used, infiltration of cold air might unnecessarily increase the air volume to be heated up. Similarly, where a hot air drier works under slight air pressure, hot air lost through leakages must be replaced by warm air, thus causing waste of heat and power for driving fans. Air infiltration in the feed end and at the discharge end of conveyor driers can be prevented by keeping openings as small as possible and by providing trap doors. Air leakages

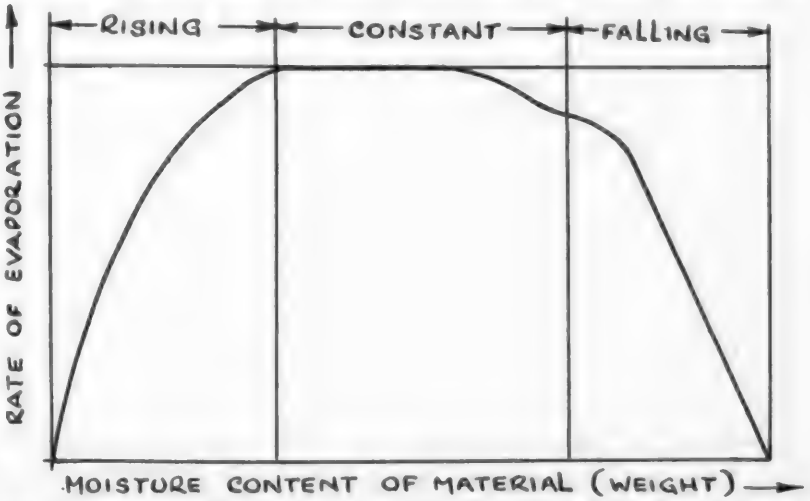


Fig. 1. Curve showing evaporation of moisture and weight of product during main stages of drying.

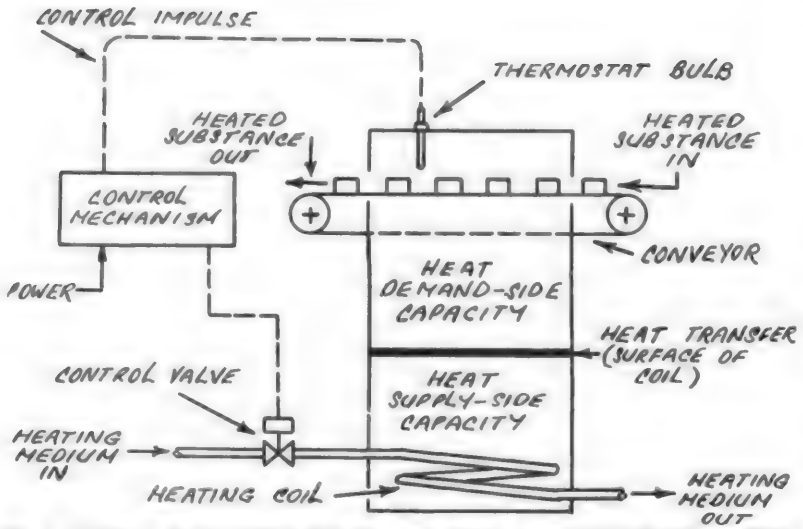


Fig. 2. Diagram of tunnel drier with conveyor, using a steam-heated air heater battery with heated coils.

from a drier under pressure can be easily detected by means of a lighted candle, and any cracks or slits in steel plate work or duct work should be sealed.

Stuffing Boxes

Gland packings of stuffing boxes on rotating steam-heated cylinders, where the steam supply pipe enters the rotating endplate, can also cause heat losses. To keep stuffing boxes tight, without increasing friction and power consumption, needs careful attention.

Where large rotary driers use a labyrinth gland between the revolving drum and the stationary end of the drier, either friction or heat losses might develop in time; minimum clearances without friction should be the aim.

Hot Air Drying

The following basic considerations apply not only to hot air drying, but also to drying by means of hot gases, whereby the products of combustion are diluted with air; this hot mixture is brought in direct contact with the material, *e.g.* bricks, grain, and certain ceramic or chemical materials. Although the term "gas" includes air, the latter expression will be applied.

In general the factors which influence drier performance are: temperature, humidity, speed of air movement, and, for continuous drying, rate of movement of material. Hot air drying is evaporation of moisture located on the surface between the fibres of a substance, and physically or chemically affixed to the smallest particles. Drying of wet solids is thus generally performed in three stages as shown in Fig. 1. The hot air first evaporates and carries away surface moisture; in the second stage it eliminates moisture deeper within the substance; and finally the last percentage of moisture is removed from within the particles.

Heat flow in hot air drying starts from the heating medium, which transfers its heat content intermediately to the air. In general, heat flow proceeds as follows: inflow of a heating medium into a heat generator, which in turn transfers the heat to the hot air. The latter in turn warms up the material to be dried, including the moisture, which has to be driven out and evaporated.

Tunnel Drier with Conveyor

Fig. 2 illustrates diagrammatically a tunnel drier with conveyor, using a steam-heated air heater battery with heating coils. The heat capacities involved are: heat content of steam in coils of the battery, the heat being transferred across the walls of the heating coils to the air. The heat content of the air is the demand-side capacity. A second heat transfer then occurs from the air to the material, whereby the heat content of the air becomes the second heat supply-side capacity, and the material to be dried is the second demand-side capacity.

Heat flow processes, which have two heat transfers, are called

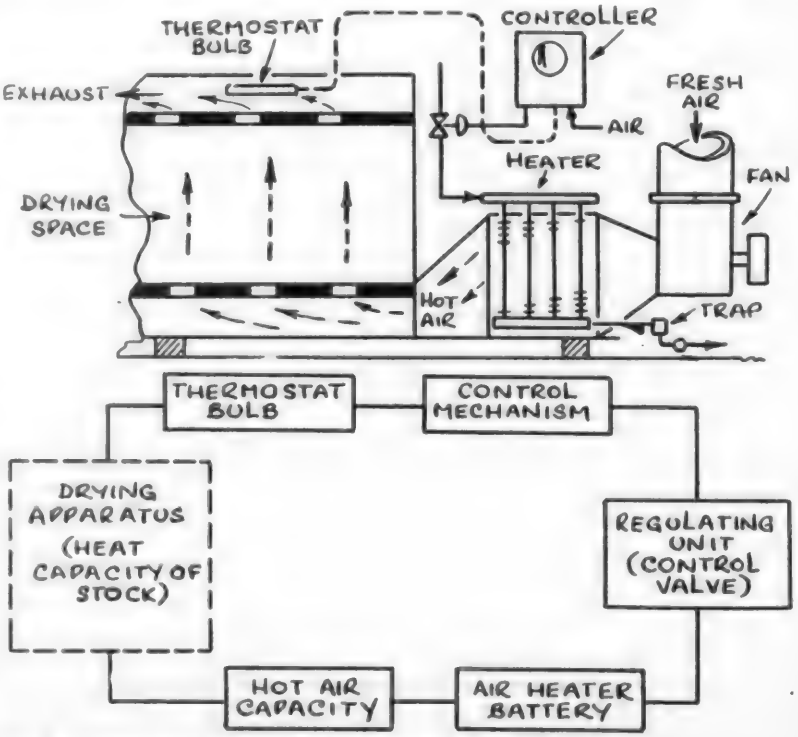


Fig. 3. Control cycle shown on hot air drier with air heater battery.

"two-capacity" processes. The diagram also shows an automatic temperature controller, applied for throttling down the heat input if the input of material on the conveyor band falls. It is of importance to realise how the drying cycle and the control cycle are interlinked, and Fig. 3 shows both in the form of a block diagram.

In any type of drier, whether batch or continuous, the quality of drying depends on balancing heat input and rate of evaporation at any particular moment. The means of influencing rate of drying, whether by hand or automatic control, are:

1. Change of temperature.
2. Change of humidity of air.
3. Change of velocity and/or direction of air, relative to the material.
4. Change of air volume.
5. Change of conveyor speed or of speed of material through a continuous drier.
6. Change of moisture content of material when entering the drier.

Each of the above factors can be controlled, thus achieving a correct rate of drying and the desired final moisture content.

Not all drying procedures are two-capacity heat flow processes. Infra-red drying and high-frequency drying have no intermediate heat carrier, and are for practical purposes one-capacity heat flow processes, whereby only the mass of the heated substances contains a measurable amount of heat, and whereby heat input can be varied without having to surmount more than one heat barrier. Both these methods are destined to play an important part in future developments of drying methods, although their wider industrial use will be dependent on first cost and on operational costs.

(To be continued.)

Iodised Salt Standards

THE recently published Report containing the Food Standards Committee's recommendation for a standard for iodised salt refers to a recommendation of the Medical Research Council, endorsed by the Ministry of Health, that prophylaxis against thyroid enlargement and goitre by the general use of iodised salt is desirable in Great Britain, and explains that legislation giving effect to this recommendation would require all salt supplied by retail sale to be treated with a trace of iodide before sale.

The Food Standards Committee's role on this occasion is to advise on the measures necessary to give effect to the medical recommendation and, more particularly, on the form in which the standard of composition should be expressed, the practicability of enforcement by chemical analysis, and on the labelling of iodised salt.

The effect of the Committee's recommendations is that within one year from the date of the introduction of a Statutory Instrument all prepacked free-running salt would be required to contain iodide in amounts equivalent to not less than 15 and not more than 30 parts of iodine per million parts of salt, and that within two years from the date of the Instrument a similar requirement would apply to all other prepacked salt. It is technically impossible to add iodide to cut-lump salt, and it follows from the Committee's recommendations that the retail sale of this kind of salt would have to be discontinued.

The trade interests were consulted by the Committee before the recommendations were made, and they concurred in the recommendations as a permanent measure, but a period of three months has been allowed for any representations which interested parties might wish to make before the standards and other provisions are given statutory effect.

Those wishing to make representations should write to Mr. K. R. Allen, Secretary of the Food Standards Committee, at the Offices of the Ministry of Food, Food Standards and Labelling Division, 47, Portman Square, London, W. 1. The closing date for representations is June 30, 1950.

New Sugar Source?

THE juices from the date, brab, coconut, and sago palms are sweet, and as they rapidly ferment they are collected for conversion into liquor. Because they contain as much as 10-14 per cent. sucrose they also constitute a potential raw material for the manufacture of sugar, a project that would carry with it the advantage that land which is at present devoted to growing sugar cane could be used for corn production.

Fermentation of Palm Juice

The conditions which encourage the fermentation of palm juice have been studied by D. G. Walawalkar of the Indian Institute of Sugar Technology, Kanpur, U.P., who has recently suggested (*Nature*, 1950, **165**, 370) a method for delaying the onset of fermentation.

It appears that fresh palm juice is only very slightly acid, about *p*H 6, but that it soon becomes as acid as *p*H 4. Probably this increase in acidity is due to the action of bacteria; possibly only relatively few species will be active at *p*H 6, but as soon as the *p*H value has been reduced to 4, then the juice will form an attractive environment to many more bacteria, and once that stage is reached bacterial decomposition, which results in fermentation, proceeds very rapidly.

Delaying Fermentation

As would be expected, the fermentation can be delayed for some hours by making the juice very slightly alkaline at *p*H 8, and maintaining it in that condition, but if large quantities of sugar are to be made from the juice it is clear that some method of delaying the start of fermentation for a much more protracted time is required. Such a method has been found in the addition of sulphanilamide to the palm juice. Quantities of from 10-60 parts per million are required—*e.g.* 40 gallons of juice require from 1·6-10 g. sulphanilamide. This material will, owing to its bacteriostatic activity, preserve the juice in its fresh condition from five to twenty days.

Food Packaging

Progress in 1949

FRANK ENGLAND

It is becoming increasingly difficult to keep abreast of every trend in the packaging of food. New materials, especially in the plastics field, keep coming forward, and research proceeds steadily in all directions. The effects of relaxations of controls on the use of materials are mainly to be seen in the attractive packs that are being produced for export, but in the home market signs of a return to higher standards are becoming more evident.

THE year under review has been one of steady development marked by events of importance. Among these may be mentioned the launching of the first national packaging exhibition at Manchester, which stressed the importance of packaging and presentation in deciding consumer preference, particularly in those dollar markets which are so essential to British economic recovery; the further equipping of Patra's package testing laboratory at Leatherhead; the extension of its packaging advisory service to non-members; the establishment of the Packaging Code; the easing of the raw materials position; and the application of a number of types of film to food packaging.

Package Testing

Although package testing has not long been in operation at Leatherhead, it has already influenced discerning buyers in their choice of packaging materials, particularly of fibreboard. A new instrument, known as a clicker-counter, has been developed which, when fitted into a package, records the number of bumps and rebounds it experiences on its way from factory to shop.

Whether recording by clicker-counter is better than recording by graph is likely to be settled in co-operation with the Research Station of the Belgian Railways, who are making parallel tests with a graph-recorder. The ultimate results of the respective tests will be exchanged between the people concerned.

Such co-operation, which is an important part of research, is well developed; arrangements are in force with the American Institute of Packaging, with the British Food Manufacturing Industries Research Association, and also with the Frozen Foods Consultants Group.

Welded to the correct shape and size, polythene linings for fibreboard drums provide an important development in fibreboard packaging for containing moisture-sensitive products. Polythene containers and linings have found wide use in the chemical industry, but when used in the packaging of foods and food ingredients it is important to ensure that they should not possess toxic or other harmful properties.

Thermoplastic Materials

In this field may be mentioned a range of thermoplastic materials which may be pure polythene or polythene incorporating other ingredients to provide specific characteristics, among which are a high standard of resistance to chemical action and mould growth, absence of toxicity, and low moisture-vapour permeability and absorption.

Polythene linings for containers of various kinds have considerable re-use life, an important factor from the point of view of cost.

The use of plastic films as packaging material is steadily advancing, and research is being continuously carried out to find new packaging applications for such products as Cellophane, Pliofilm, Alkathene, Clarifoil, and others.

Food packers have welcomed the return to the home market of metal paper, metal foils, and metal foil laminates, particularly in confectionery packs. Development in the use of metal foils may be expected in the packaging of quick frozen foods. Laminated foils, for example, although technically suited for such packaging, are too expensive at present for the small producer, but a laminated pack of waxed paper board and aluminium foil is being used by two or three large frozen food firms. In the United States a specially treated aluminium foil pack for packaging quick frozen foods is claimed to be airtight, leakproof, a barrier to moisture vapour, and one which is light-excluding.

The new aluminium pack for fish fillets, described in the March, 1950, issue of FOOD MANUFACTURE, is receiving support from some 300 fish distributing firms representing the distribution section of the Hull fishing industry. It is claimed that a light and inexpensive form of this pack could be developed for almost all perishable foods.

Machinery Developments

The year has seen developments in bread-wrapping machinery. Paper—not necessarily waxed—is the preferred wrapping material at present, this being the only kind considered to be economically practicable under existing conditions.

A seamless sack woven on the Saint Frères circular loom has attracted much attention; woven tubular cloth has only to be cut into suitable lengths and hemmed at one end and sewn at the other to form finished sacks.

Tests have shown that sacks produced in this way are stronger than those made from equal quality material woven on flat looms. In one series of tests, 32 sacks each filled with 160 lb. of wheat were dropped from a height of 4 ft. 6 in. Sixteen of the sacks made on circular looms remained

Colours are well chosen in the Benger's Malted Milk export pack.
Photo The Metal Box Co.

The use of Clarifoil as a packaging for foodstuffs ensures maximum safety and protection.
Photo British Celanese.

Colour plays an important part in this pack for Cornish Pilchards, the main feature of which is a background map of Cornwall.

The use of aluminium drums with polythene linings may be extended to the food industry.
Photo Rediweld.

Confectionery packed in Pliofilm containers is guaranteed to retain its freshness.
Photo Goodyear Tyre and Rubber Co.

intact, while 15 of the 16 sacks that were woven on flat looms were damaged—mostly at the side seams.

Some interesting new packs have been produced by The Metal Box Co., mainly for the export market. One of these, for dried peas, is a composite package, which is spirally wound and has a metal top and bottom. The printed label goes over the spiral joins, the contents being illustrated on the body of the container.

Biscuits by Meredith and Drew are being packed for export in tins which have a dagger top beneath the lid, giving hygroscopic protection and emphasising the appeal of freshness.

Reproductions in five and six colours of fine paintings are being used by Peak Frean, while for simple design and happy use of colour harmony a new pack for Benger's Malted Milk is outstanding; in this pack the coated lid makes its reappearance.

Another pack worthy of note from the point of view of design is that of Cornish Products, of Looe, for the home and export markets. Colour plays an important part in this pack, and its main feature is a background map of Cornwall. The sea is in pastel blue, the land in a sand buff, the town and place names and the company's name in black. The words "Cornish Pilchards" are outlined in bright red.

In the equipment field, a new gumstrip machine, introduced by Samuel Jones and Co., is intended for high-speed bale and package sealing. It shoots off and cuts moistened tape in lengths controllable up to 36 in. and up to 4 in. wide. The automatic cut-off is claimed to save up to 30 per cent. of tape by counteracting the packer's natural tendency to tear off more than is necessary.

Another item of equipment is a continuous heat sealing machine for packages made from plastic materials.

On the whole, developments during the past year have been encouraging, and it is reasonable to expect that the Progress Report for 1950 will record still greater advances.

Food Miscellany

DR. SCHILLER'S treatise* provides a well-balanced study of baking powders, blancmange powders, vanillin-sugar, and infant foods, a group of products in which, on the whole, carbohydrates predominate. A straightforward account of the properties and chemical characteristics of standard powders as well as of those which for various reasons have failed to establish themselves with the trade and some rather sketchy details of blending, packaging, and labelling make up the first chapter.

Blancmange powders and related products for the production of desserts appealing to the Central European palate are largely based upon starch; about 40,000 tons were used for this purpose in Germany in 1938.

Other ingredients are gelatin, chocolate, essences, pectin, dried fruits, and nuts. This subject is covered in a chapter, which also includes a summary of recent patents in the field of cold-swelling starches, a class of raw materials which played a big part in the diet of the German Armed Forces in the recent war. This chapter concludes with a brief account of the manufacture of ice cream powders with emphasis upon German public health regulations.

Vanilla, vanillin, and vanillin-sugar (a blend of sugar with 1 per cent. vanillin) and similar products containing vanilla, which are available for exploiting the powerful flavour of the natural product, are described in Chapter 3, while Chapter 4 is concerned with the extraction and properties of the essences commonly used in bakery and allied products.

Further on in the book the author turns away from the more or less technical aspects of food manufacture and considers the multitude of regulations of concern to German manufacturers of the products previously discussed, and the standard methods for evaluation and analysis of the same group of products.

A technical discussion is concerned with the ingredients and compounding of infant foods in some detail, and statutory regulations for the infant food industry and analytical methods are also given.

Although specialists in any of the branches concerned are unlikely to pick up many useful hints, the book can be recommended to food chemists in general as a concise survey from the German angle of some important carbohydrate-based products and their auxiliary agents.

A companion† to this volume follows broadly the same plan in presentation, but is much more attractive from the manufacturer's standpoint by virtue of the greater emphasis on practical aspects. Separate chapters are devoted to raw materials, to the manufacture of soup powders, soup pastes, liquid soups, and hydrolysed protein products (animal and vegetable), to analytical procedures (inevitably with reference to the requirements of German food laws), and to insect pests.

Of outstanding practical interest is the chapter on the manufacture of hydrolysed proteins and meat concentrates. Other chapters deal with the chemistry of amino acids and proteins, with the relative merits of fermentative and acid hydrolysis, and with the patent literature of protein separation and hydrolysis.

The chapter on insect pests is well illustrated, and the value of the chapters dealing with manufacturing and packing techniques is enhanced by the many diagrams and photographs of equipment. Other products considered in short sections are yeast extracts, soya sauces, and glutamic acid.

The book can be considered a useful addition to the libraries of all manufacturers in the fields covered.—L. L.

* *Back- und Puddingpulver, Vanillinzucker, Kindernährmittel* (Baking Powders and Blancmange Powders, Vanillin-Sugar, Infant Foods). By K. Schiller. Pp. 162. Wissenschaftliche Verlagsgesellschaft, Stuttgart. Price DM. 12.80.

† *Suppen, Sossen, Würzen, und Brüherzeugnisse* (Soups, Broths, Hydrolysed Protein Preparations, and Meat Concentrates). By K. Schiller. Pp. 252. Wissenschaftliche Verlagsgesellschaft, Stuttgart. Price DM. 18.75.

News from the Industry

FORTHCOMING EVENTS

Plant Engineers' Conference

Under the presidency of Mr. E. G. Phillips, O.B.E., the third annual conference of Incorporated Plant Engineers will be held at Nottingham from Thursday, May 18 to Saturday, May 20, commencing with a civic reception at the Council House.

The Friday will be devoted to the annual general meeting, other domestic business, and works visits to the principal industries of Nottingham.

The main speakers, Sir Ernest Smith (a past President of the Institute of Fuel, and chairman of the Industrial Coal Consumers' Council) and Mr. Lewis C. Ord, will be heard on Saturday morning.

The conference will conclude on the Saturday with motor coach tours of the Dukeries, a golf tournament, and theatre parties in the evening.

Mechanical Handling Convention

A convention is to be held at Olympia from June 6 to 17, at which methods of introducing new equipment, overcoming workers' prejudice, and adjusting wage rates, which have been among the most important problems in extending the use of mechanical aids, will be discussed jointly for the first time by manufacturers and users of the equipment, including trade union representatives. A full day's discussion will be led by Capt. Mark Hewitson, M.P., of the General and Municipal Workers Union, and Dr. W. H. Garrett, a director of Monsanto Chemicals.

The Anglo-American Council on Productivity, under whose auspices a Mechanical Aids Team from Great Britain recently visited the U.S.A., has accepted an invitation extended to the team to take part in the convention, and the team itself will organise a discussion of its report.

Authoritative papers to be discussed at other sessions, which will be held at 11 a.m. and 8 p.m. daily, cover production engineering, time and motion studies, overhead chain conveyors in factories, aerial ropeways, control of electric power and sequence flow, screens and feeders, power trucks and fork trucks, goods and package handling, storing and reclaiming materials, elevators, and skip hoists.

Portable Testing Instruments

The completely new range of Megger testers, which were first shown at the 1949 Engineering and Marine Exhibition, are now in full production by Evershed and Vignoles. The instruments are housed in black plastic cases size $7\frac{3}{4} \times 5 \times 5\frac{3}{4}$ in., and have spring terminals. Light in weight, easily portable, and entirely self-contained, the instruments include insulation, continuity, and earth and earthometer testers. Their scale ranges are moderate, and they incorporate in a small instrument certain features hitherto available only in larger and more costly models.

One of the new portable testing instruments.

The insulation tester, which has a scale range up to 50 megohms for testing at pressures up to 500 volts, incorporates a constant pressure generator ensuring steady readings when testing cables having electrostatic capacity or circuits fitted with suppressors. Other features also available include a live line detector to protect the instrument during continuity tests on live circuits, and a dial illuminating attachment for use when the instrument is used in indifferent light.

The earth and earthometer testers are twin range instruments having scales of 0-40 and 0-200 ohms, or, if preferred, 0-100 and 0-500 ohms. The earth tester determines the resistance to earth of earth electrodes, while the earthometer tester, which has a live line detector and special switch, measures with safety the impedance of complete earthing circuits, including the resistance of the sub-station electrodes and those at the consumer's premises.

Crop Protection Panel, S.C.I.

The newly formed Crop Protection Panel of the Society of Chemical Industry, which is also concerned with the protection of livestock and stored products, held its first meeting at the Royal Institution, Albemarle Street, London, W.1., on April 27 at 6 p.m., when Dr. H. Martin spoke on "Advances in Chemical Methods of Crop Protection."

Pressure Cooking

An improved pressure cooker which brings new principles to bear on the scientific perfection of high-temperature cooking—namely, effective sterilisation, heat control, and regulation of pressure—was demonstrated at a press conference given by the makers of the Prestige cooker at the Savoy Hotel recently.

The new cooker has a three-way pressure control and is of a size that permits the cooking of fresh foods, sterilisation of fruit and vegetables in bottles, and the sterilisation of infant feeds.

Travel Warrants for Firms

A new system of warrant travel to enable firms to obtain rail tickets for business purposes, without payment of the fare at the time of booking, has been introduced by the Railway Executive.

Firms using this new service can obtain at cost from the Railway Clearing House a book of 100 warrants which may be exchanged at station booking offices or British Railways town offices for first or third class ordinary single and return, monthly return, or (where available) cheap day tickets, and for sleeping-car reservations. Firms are required to deposit from £50 to £100 according to the size of their organisation, and accounts for tickets issued will be rendered monthly.

The system applies to traders irrespective of whether they consign merchandise traffic by rail or not.

Rewards for Long Service

Gold wristlet watches were presented to six long-service employees of British Fish Canners by the chairman and managing director, Mr. C. W. Banks, F.G.I., at the recent annual dance, dinner, and social evening of the company.

Society of Public Analysts

At the seventy-sixth annual general meeting of the Society of Public Analysts and Other Analytical Chemists held recently under the chairmanship of the President, Mr. George Taylor, O.B.E., F.R.I.C., it was stated that the present membership of the Society was 1,547, an increase of fifty-one compared with the corresponding figure for last year. In addition to seven meetings of the Society, there had been twenty-four meetings held by its sections and groups in the course of the year.

The officers and members of Council were elected for the ensuing year:

President: George Taylor, O.B.E.

Past Presidents serving on the Council: Lewis Eynon, E. B. Hughes, G. Roche Lynch, G. W. Monier-Williams.

Vice-Presidents: D. C. Garratt, J. G. A. Griffiths, J. R. Nicholls.

Hon. Treasurer: J. H. Hamence.

Hon. Secretary: K. A. Williams.

Other Members of Council: A. L. Bacharach, H. H. Bagnall, J. Haslam, D. W. Kent-Jones, A. A. Smales, E. Voelcker.

R. C. Chirnside, E. T. Illing, J. King, C. J. Regan, and N. Strafford, having been elected members of the Council in 1949, will, by the Society's Articles of Association, remain members of the Council for 1950.

J. G. Sherratt (chairman of the North of England Section), J. Sword (chairman of the Scottish Section), R. Belcher (chairman of the Microchemistry Group), B. S. Cooper (chairman of the Physical Methods Group), and N. T. Gridgeman (chairman of the Biological Methods Group) will be *ex officio* members of the Council for 1950.

At the conclusion of the meeting, the first Bernard Dyer Memorial Lecture was delivered by Sir E. John Russell, O.B.E., D.Sc., F.R.S.

Obituary

We regret to record the death of Mr. J. E. Nash, for many years one of the managers of Robert Jenkins and Co.

Mr. Nash had been with the firm since his apprenticeship in 1908 at the age of 16, and was on two occasions the recipient of special awards for service.

We also regret to record the death of Mr. Harry Sexton, works and malting manager of Edward Fison, Ltd., for twenty-nine years.

APPOINTMENTS

Mr. Philip W. Milnes has succeeded Mr. Ian Youl as personnel manager at Wall's Godley factory. Mr. Youl is leaving to take up an appointment in Canada.

*

Colonel M. A. McEvoy, C.B.E., M.I.Mech.E., has joined the board of directors of Bamag.

He has been closely connected with heavy engineering for many years, and has travelled widely in recent years to ascertain the true needs of foreign markets for British engineering knowledge and machinery.

Dr. E. H. T. Hoblyn.
Photo Leonard Hill Ltd.

Dr. E. H. T. Hoblyn, M.B.E., Ph.D., A.R.C.S., F.R.I.C., A.M.I. Chem.E., has been appointed to succeed the late Mr. Norman Neville as director of the British Food Machinery Manufacturers' Association.

As secretary, Dr. Hoblyn has been associated with the work of the organisation as the Food Machinery Industrial and Export Group, and latterly as the B.F.M.M.A., and was closely identified with the late director in the development of its export and numerous other activities.

*

Dr. I. A. Preece, F.R.I.C., F.R.S.E., who has been appointed by the Heriot-Watt College, Edinburgh, to the newly created Chair of Brewing and Industrial Fermentation, is a biochemist with long experience in fermentation techniques, and for the past eighteen years he has been lecturer in biochemistry at the College. He is editor of the *Journal of the Institute of Brewing* and has been actively associated with many developments in recent years.

The appointment and the creation of the Chair are regarded as a major advance in Edinburgh's position in this field, and there will be active co-operation between College and industry. The Brewers' Association of Scotland is assisting in this development.

*

Mr. George J. Pilbeam has been appointed managing director of Walworth Limited, succeeding Mr. V. L. Young who, however, is remaining in the company as chairman of the board.

With the exception of his service in the 1914-18 war, Mr. Pilbeam has been continuously with Walworth's and their predecessor since 1914.

Experience in all departments fitted him to represent the company as a traveller, from which position he progressed to be assistant sales manager, sales manager, and, in 1944, a director of the company.

*

Mr. J. D. Ironside, M.P.S., has been appointed by the Distillers Company as senior outside representative of their yeast and malt extract department.

Herring Pack Research

The development of suitable flavourings for herring packs at Port Glasgow is being continued by the Herring Industry Board, who are at present working on tomato variations.

The Port Glasgow factory, which is devoted partly to commercial packing of herring and partly to research work, was established in co-operation with the British Food Industries Research Association in an effort to achieve new types of herring packs. Since the beginning of 1950 the Board have assumed individual responsibility for the factory, and are operating it as a research unit while also continuing practical work.

Over the past year, the research side has experimented with a wide range of flavourings and some interesting combinations have been evolved. On the practical canning side the factory had a very busy season, and the excellent quality of the west coast catch over the past year made the pack a most successful one. The situation of the Port Glasgow estate allows full advantage to be taken of the long season.

Dairy Firm Visit Works

Leading members of the executive staff of H. A. Job, Ltd., made a tour of the main works and sub-factories of the A.P.V. Company recently.

Short talks were given by various members of the A.P.V. technical staff and the party was shown some research work on corrosion in progress in the laboratories.

The visit was part of H. A. Job's staff training programme. Mr. Howard, one of the directors, who came with the party, expressed the belief that experience of this kind would become increasingly important as specialisation created new subdivisions of technique. He said that, in spite of the difficulty of organising tours such as this during working hours, he was convinced of their value.

Control of Liquid Levels

The application of control of liquid levels for which Elcontrol equipment can be installed is exemplified in a fermentation process of the Distillers Company.

A vat containing liquor and added yeast fills with yeast foam as the fermentation proceeds. The foam, on reaching a predetermined high level, is caused to subside by the addition of a small quantity of a fatty oil. In order to avoid the necessity of frequent inspection of the foam level, equipment consisting of two probes using fittings type FE 1, and a fluid level control unit was supplied. The probe fittings are mounted through a fixed section on the hinged top cover of the tank so that one probe projects downwards to the maximum foam level, while the second is a few inches longer.

As soon as the foam touches the high level probe end, the control unit responds, and admits a small quantity of the foam-reducing medium by means of a magnetic valve. The foam then subsides, and the control unit closes the magnetic valve as soon as the foam breaks contact with the end of the longer probe. The purpose of the two probes is to ensure that the valve remains open long enough to admit sufficient oil to cause complete subsidence of the foam.

London Office Opened

A new London office has been opened by the Warwick Production Co. at Slough Estates House, 16, Berkeley Street, London, W.1 (Tel.: Regent 4231).

Members of the executive staff of H. A. Job watch a demonstration of the argon arc method of welding stainless steel at the A.P.V. Company's works.

New Factory Premises

Plans to extend their factory at Victoria Road, London, N.W.10, have been drawn up by Carltona, cake and custard powder manufacturers.

▪

Hull Corporation Planning Committee has approved plans for the erection of new premises at Cleveland Street by British Cocoa Mills (Hull).

▪

Marshall Martin and Co., manufacturing confectioners, are proceeding with plans to rebuild their factory at Bollo Lane, Acton, W.3, which was destroyed by fire recently.

▪

A new three-storey factory is to be erected at Queen Street, West Bromwich, for Robinsons (Confectioners).

Ice Cream from the Ocean

Herring oil and seaweed extract were the main ingredients of ice cream served at a tea party organised by Lowestoft White Fish Allocation Committee.

The chairman, Mr. G. T. Atkinson, former District Inspector of Fisheries, showed the guests a bottle of tasteless and odourless fat made from herring oil. He also displayed samples of seaweed from which alginate is now being extracted for use in jellies and other food products. "So long as we have herrings in the sea and seaweed round our coasts," Mr. Atkinson said, "we need not be short of ice cream."

Gauge Numbers for Packaging Film

A system of gauge numbers for defining the thickness of Alkathene film, introduced by Imperial Chemical Industries, relates gauge numbers to thickness in thousandths of an inch and should be used in all orders or enquiries as follows:

Gauge No.	*Thickness in.*	*Yield in sq. in. per lb.*
150	0·0015	20,000
200	0·0020	15,000
300	0·0030	10,000
400	0·0040	7,500
500	0·0050	6,000
700	0·0070	4,290
1,000	0·0100	3,000

Fruit Canners' Difficulties

Apart from the sugar shortage, the Ministry of Food have informed the N.F.U. that tinplate supplies for the manufacture of cans will be insufficient to meet the fruit canning industry's needs in the coming season, but that with the opening of new tinplate factories it is expected that supplies will be adequate by 1951.

The Government have stated that the canning industry will have the first priority in supplies until production is sufficient to meet all needs.

Following the Union's strong opposition to the proposal to cut the sugar allocation for canning in 1950, a small working party has been set up to consider methods of overcoming this difficulty, and the Union will be kept closely informed of any recommendations that it may make.

Examples of the new H.P. Sauce and Tomato Ketchup packs.

Improved Sauce Bottle Tops

A 30 mm. deep roll-on seal type cap which gives a more comfortable finger grip and is both easier to unscrew and handier to replace is the latest improvement on the H.P. Sauce pack. As the threads are set lower down on the bottle neck, there is not such a tendency for the sauce to be squeezed into them when the cap is put back.

A deep cap (in this case a 33 mm. deep roll-on seal) is also appearing on the bottles of H.P. tomato ketchup.

Overseas consumers have had these packs for some time, but it is only recently that supplies have been sufficient to produce those bottles in satisfactory quantities for the home market.

Wrapping of Foodstuffs

A letter is being sent by the British Paper Bag Federation to all local authorities and Medical Officers of Health, informing them of the improved supplies of paper bags for the hygienic protection of foodstuffs.

When issuing their model bye-laws, the Ministry of Food intimated that at that juncture they felt unable to include a bye-law imposing any positive requirement as to the wrapping of food on retail sale, owing to the shortage of wrapping paper which existed at the time.

The Federation now reported that the paper supply position has since improved, and there are sufficient supplies to ensure that foodstuffs are more fully protected against contamination.

Exhibition of Pictures

During the last few years The Metal Box Company have amassed a large and varied collection of pictures by well-known artists and members of their own studios. Although they range from oils in traditional styles to modern colour photography, they are all suitable for reproduction on metal, board, or paper.

At an exhibition of pictures held at the Mayfair Hotel recently, the company showed a selection of these, many of which are available for reproduction as packages or display material. A number of the company's products were also on show.

Jam Standards Criticised

Better jam is possible this year if Scottish growers have their way. The Tay Valley, Blairgowrie, and Dundee branches of the N.F.U. are all pressing the Union to urge the Ministry of Food to alter fruit content standards for jam to relieve a threatened spate of overproduction this year.

Blairgowrie growers have criticised the retention of 20 per cent. raspberry and 30 per cent. strawberry contents standards against the pre-war standards of 30 per cent. and 40 per cent. In view of the expected glut of home supplies this year as well as the prospect of ample imports, growers contend that there is no necessity to retain the existing low standards, which, if left unaltered, will adversely affect the amount of earnings in the coming season.

Refrigeration Sales Convention

Delegates from all parts of the British Isles attended the recent sales convention at the works of the Pressed Steel Company.

The convention was officially opened by Mr. M. A. H. Bellhouse, assistant managing director, and the opening talk was then delivered by the general sales manager, Mr. H. H. Lawrence.

Particular attention was given to the many branches of the food trade and their refrigeration needs, and the frozen food, milk, ice cream, and meat trades were made the subjects of special talks.

Changes of Name

The title of the London branch of the Automatic Weighing and Packing Machine Co., which has been operating under the name of Autopack (London), Ltd., has now been altered to Autopack, Ltd.

*

For many years British Soya Products have been selling to the baking trade under the name of X.24 a soya flour, specially milled for bread manufacture; this product is an enzyme active soya which will now be known to the trade as Bredsoy.

Aspects of Gas Supply

There is a big demand for gas in the baking and other industries, while the number of additional licences for fish frying issued during 1948 led to a pronounced increase in the use of gas for this purpose, it was stated by E. C. LeJeune, M.S.E., M.Soc.C.E. (France), M.Inst.Gas E., in a paper on "Some Aspects of Gas Supply," given before the Society of Engineers (Inc.) recently.

Data were given relating to the industry, which carbonised some 23,000,000 tons of coal annually, providing employment for about 80,000 miners. In addition to the manufacture of 430,800,000 cubic feet of gas, large quantities of coke, tar, and other valuable products were rendered available for use.

Mr. LeJeune mentioned the important part that gas will play in the provision of restaurant, snack bar, heating, and hot-water supply services during the 1951 Festival of Britain Exhibition. This project will incorporate what are believed to be the largest gas-fired boilers yet manufactured for duty on town gas supplies.

Non-ionic Emulsifying Wax

A preparation of stearyl alcohol and ethylene oxide reaction products, Polawax represents a new form of the self-emulsifying combination now becoming increasingly known as "emulsifying wax."

Produced by Croda, this wax differs from other grades in that its oil-in-water producing properties do not derive from the presence of auxiliary anionic surface-active agents of the soap, sulphonated oil, or sulphated fatty alcohol type, or from alkalies, gums, etc. It is non-ionising in character and will be of interest in the making of creams that have to be autoclaved.

Firm Secures Dollar Order

The Government of the Netherlands Antilles has placed another order with G. and J. Weir for evaporating and distilling plant, to cost 500,000 U.S. dollars. This is the firm's second large dollar order in two years for this type of equipment, and follows a visit by a senior executive of the firm to the islands of Curaçao and Aruba, where the plant will be installed.

A number of these plants, which produce fresh water by distillation from sea-water, have already been installed by the company and have been used to supplement the limited water supply on these islands.

Scottish Whaling Plans

Plans are going ahead for the development of the whaling industry in the north of Scotland. Scottish Whalers, Ltd., plan to carry on whaling from the island of Harris, which was formerly used as a whaling point, and will probably use two whaling ships for this purpose. After the boiling out of the blubber, the whale meat will be kept in cold storage until marketed.

Captain Hans Zespersen, a Norwegian, is one of the promoters of the scheme. He was for a time manager of a company in the Antarctic, and has had over forty years of whaling experience.

Advances in Food Manufacturing Equipment at the B.I.F.

BIRMINGHAM

Electrical Equipment

The exhibit of The G.E.C. on stand C.503/402 will be divided into three parts, displaying airport lighting equipment, street lighting equipment, and motors, motor control gear, and accessories.

A.C. and D.C. industrial motors of all types and motor starters will be shown and a complete range of squirrel cage motors from ½ h.p. to 3 h.p. at 960 r.p.m. will be on view, with one in sections to show its design. A demonstration electronic motor control unit will illustrate the salient features of this form of control.

Machine Tools

Sheet metal working machinery, including a combined punching, shearing, cropping, and notching machine and an open front inclinable power press, as well as hydraulic presses, will be shown by George Cohen, Sons and Co. Also featured in the 600 Group pavilion and outdoor exhibit (outdoor stands 1334 and 1827/1226) will be models of the Jones KL mobile cranes, high-grade steel castings, steam engines and air compressors, and examples of iron castings.

*

A feature of the exhibit on stand D.411 will be the production of lever lid and slip lid tin boxes. Operations demonstrated by F. J. Edwards will be the blanking of lever lids on a Besco power press and side seaming of the bodies. Lever lid and slip lid cans will be treated by a trimming and beading machine and a round double seaming machine. A curling attachment will also be used. Guillotines, a nibbler-shearing machine, bar cropper, rolling machine, and combination machines for swaging, wiring, trimming, and other duties will also be on view.

Gas in Industry

The important part which gas plays in aiding Britain's industrial output is the keynote of the Gas Council stand, D.689 and 538, and various articles will be shown to illustrate the comprehensive range of products in the manufacture of which gas is used.

As an example of the gas-fired equipment used in industry there will be a working model of a vertical slot furnace for tube and bar heating.

The commercial section of the stand will emphasise the use of gas in industrial catering. The equipment on view will include a solid-top range, pastry oven, friers, steamer, and boiling pan.

Industrial Plant

Stands D.719 and 1860 (outdoor) will be designed to show the activities of the various companies of the Thos. W. Ward group.

The indoor stand will display photographs of those aspects of the group's operations which cannot be exemplified by actual equipment such as factory planning and installation work. Examples of industrial plant shown on the outdoor stand will include sheet metal working machinery, woodworking machinery, pumps and compressors, and various items from the Polford range of foundry plant.

The Silent Machine and Engineering Company's section of the stand will be given over to the demonstration of the Ward-Swift range of food preparing machinery.

Electric Vehicles

Examples of the industrial type Graiseley pedestrian controlled electric vehicle will be on view on stand C.229, where Diamond Motors (Wolverhampton) are exhibiting. There will also be shown a number of assembled components, notably a complete power unit of patented design, comprising driving motor, centrifugal clutch, reduction gear box, taper roller bearing steering head, and control and steering column. Towing and stillage vehicles will exemplify variation of chassis structure to meet special requirements.

Ceramic Materials

The Royal Doulton Potteries' exhibit on stand D.748/642 will be devoted to four branches of industrial ceramics: chemical stoneware; laboratory and technical porcelain; porous ceramic media and filter units; and electrical porcelain. The centrepiece of their exhibit will consist of a large absorption tower connected to a 200 gallon reaction vessel by socket and spigot piping. The tower will be fitted with a distributing plate, perforated plate, and tower packing, and the scrubbing effect inside the tower will be visible through a glass inspection opening.

Tilting jacketed pan.
Taylor Rustless Fittings Co.

Steel Vessels

A recent development of the Taylor Rustless Fittings Co. on show at stand B.504 will be a jacketed pan with stirring gear which is retractable to allow the pan to be tilted for emptying. All working parts associated with the stirring gear are enclosed, as well as the motor and its control gear. A syrup pump, and a milk pump of entirely new design which is simple in operation and can easily be dismantled for daily sterilisation, will also be shown.

*

Welded steel boilers and tanks will form the chief part of the exhibits of Robert Jenkins and Co. These will include a 30 barrel stainless steel beer tank complete with fittings, and 25 and 100 gallon stainless steel steam jacketed hemispherical pans. Also to be seen on stand D.242 will be a mild steel mixing pan with agitator and a working model of a sugar drier.

*

Stand D.635, where Thompson Bros. (Bilston) are to exhibit, will be mainly occupied by the shell of a large stainless steel mixer, partly fabricated and roughly polished inside. Alongside the vessel will be the stainless steel covered shaft which passes through the centre of the vessel. On view for the first time will be a centre drive centrifugal machine for use in hot dip galvanising, but adaptable for tinning and oil separation.

Stainless steel sheets, strip, bars, tubes, sections, wire, and castings, together with demonstrative applications of these materials will be exhibited on the stand of Padley and Venables, D.422.

*

A jacketed pan fabricated from stainless steel, clad with a galvanised mild steel outer jacket, and having a working pressure of 30 lb. per sq. in. will be shown by W. P. Butterfield on stand B.519.

Trucks

Drum, lifting, and other types of trucks, portable stackers, drum and barrel stillages, ladders, barrows, and castors for every line of industry are manufactured by H.C. Slingsby, who will display a selection of their equipment on stand B.419.

Battery-operated fork lift truck.
I.T.D., Ltd.

A new battery-operated fork truck with a capacity of 1 ton at 24 in. load centres and a lift of 9 ft. will be exhibited for the first time by I.T.D., who will provide working demonstrations on stand 1356 outdoor. Other Stacatruc models will include a 2 ton capacity petrol-powered fork truck and standard fork truck fitted with a rotating head. A petrol-powered mobile shovel, Aerolift fork trucks, and Electricar battery-operated trucks will also be on view.

*

Shown for the first time on stand A.309 will be 3 h.p. models of the Wrigley motor truck. Suitable for use in most industries and also for horticultural and agricultural applications, these trucks, of which 1 h.p. models are also available, are manufactured with a composite range of body styles by Wessex Industries (Poole). A representative selection of their products, including general-purpose trucks, a dual-purpose tipper/flat platform, and a 3 h.p. tug, together with hand trucks, trolleys, and sack trucks, will be on view on this stand.

Measuring Instruments

Various types of mercury-in-glass, mercury - in - steel, and electrical thermometers will be shown by Negretti and Zambra. Air-operated controllers, pyrometer controllers, pressure and draught gauges, and transformer temperature controllers will be displayed on stand D.237, and a demonstration of both hand pump and continuous air supply methods of level indication (pneumatic type) instruments will be given.

*

A comprehensive exhibit of mercury-in-steel and vapour pressure thermometers, humidity recorders, and draught and pressure gauges and recorders will be staged by the Cambridge Instrument Company, on stand D.758.

The temperature measuring instruments comprise indicators with dials of 4 in., 6 in., and 8 in. diameter, recorders, and thermometer regulators for the automatic control of temperatures in a wide variety of applications. A double recorder with two pens, one of which records humidity and the other temperature, will form an interesting part of the exhibit.

Thermometer regulator.
Cambridge Instrument Co.

Metallising Process

The main feature on stand D.524 will be a full-scale shot blast and spraying unit to demonstrate the Schori method of flame spraying metals and plastics by the powder process. The plant displayed will consist of a shot blast cabinet fitted with a bag filter dust arrestor, and a spraying booth in which protective and decorative coatings are applied.

A variety of articles flame sprayed with zinc, aluminium, tin, lead, copper, and plastics for protection against various forms of attack, will be shown.

Structural Steelwork

The main structure of stand B.611/508 will consist of a steel framework incorporating metal windows and partitions, doors, and dovetail sheeting made and erected by Fredk. Braby and Co. Free standing exhibits will include typical examples of metal products for the food, chemical, and other industries such as steel drums, perforated metals, culverts, aluminium products, bins, and examples of fabricated metal platework.

A gooseneck elevator, made for the food industry by their subsidiary, the G. C. Engineering Co., will form a working exhibit.

Lighting Fittings

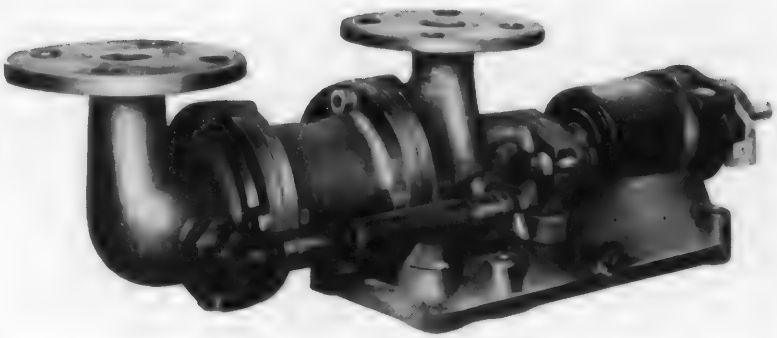
A new electric lamp and coloured fluorescent lighting tubes will be exhibited on the Crompton Parkinson stand C.609. Known as the Whitelight, the lamp gives a richer, softer light than the ordinary lamp as the result of the development of a new technique of applying an internal coating of silica to the bulb; it also improves the illumination provided by all lighting fittings, especially those revealing all or part of the lamp, because it is glareless and subdues all shadows.

▪

New instant start fluorescent lamps are being shown for the first time on the B.T.H. stand C.511/410.

Other types of lamps, and fluorescent lamp fittings will be displayed, while a series of dioramic panels will show models of installations of fluorescent lighting in factories, etc.

Part of the company's stand, C.106, at Olympia, will be devoted to a display of lamps used for photographic purposes.



New prototype pump which provides an additional range of capacities from 360 g.p.h. at 50 ft. head to 220 g.p.h. at 150 ft. head.
Mono Pumps.

Pumps and Valves

By means of models giving a physical explanation of the principle of the Mono pump, stand D.716 will provide a technical approach to the pumping problem. Of particular interest will be a stainless steel pump for handling pulps, syrups, and viscous materials such as chocolate and cream. Various prototypes of additions to this range, including a large stainless steel pump for handling fruit pulps and a small pump for handling viscous materials, will be displayed.

Working units will demonstrate the suction power and the kind of fluid and substances handled by the Mono pump.

▪

A combined valve and pump display will form the central feature of stand D.129, affording a practical demonstration of the flow and closure of Saunders diaphragm valves and the good delivery of Safran pumps. Sectioned models of small and large valves will make clear the advantage of isolating the operating mechanisms. Pressure operation by remote control will be demonstrated with both piston and air motor operated valves, and examples of the various other means of actuation will be shown. Pumps seen will be representative of both size and type and will also, by different forms of drive available, show their adaptability to all conditions.

▪

A 6 in. version of their Ejectopump, specially designed for pumping latex in bulk, will be shown by Gresham and Craven on stand D.139. This company's range of compressed air-operated displacement pumps which are purely pneumatic in action can be arranged above the level of the liquid to be pumped, as they are self-priming.

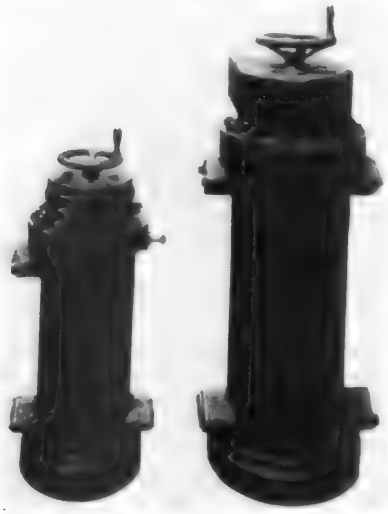
Pulverisers and Grinders

A selection of machines representative of the full scope of British Jeffrey-Diamond crushing equipment will be displayed on stand D.526. A single roll breaker, a flextooth crusher, and a swing hammer pulveriser will be included, as well as the Atomill fine grinder, and the Midget model of this machine which, although designed for laboratory work, is robust enough for small batch production.

Mazda fluorescent lamp fitting for industrial use.
B.T.H. Co.

Heating Equipment

Heaters suitable for use in tea drying, milk processing, and in plants handling the drying of bottles and jars for containing food are manufactured by the Spiral Tube and Components Company, whose exhibits will be seen on stand D.710. The range includes all-electric unit air heaters, engine oil and water coolers, and intercoolers and aftercoolers for air compressors.



Electrode hot water boilers.
Bastian and Allen.

Electrode steam boilers with outputs ranging from 100 to 4,500 lb. of steam per hour and various hot water boilers with both handwheel and automatic adjustment of the load are to be exhibited by Bastian and Allen. A standard 70 kW. boiler will be working to illustrate the principle of their new pressure control, and auxiliary equipment will also be on show. Wall-mounting non-pressure type electric storage water heaters, immersion heater elements, and photographs of installations incorporating heating equipment will complete the display on stand C.710.

Barrier Creams

A range of anti-dermatitis barrier preparations will form the principal exhibit of Rozalex displayed on stand D.706.

The Rex dispenser, an appliance developed by the company to provide an economical and uncontaminated supply of barrier cream to the worker in the factory whenever required, will also be shown.

Photographs illustrating the uses of the cream as well as demonstrations will complete the exhibit of the company.

Adhesive Tapes

The full range of products manufactured by Durex Abrasives will be shown on stand D.314; a section will be devoted to a display of self-adhesive tapes, including cellulose tape which, in transparent and coloured form, is used for the sealing of food packs.

Meter Testing Equipment

A representative display of their meter testing equipment, comprising a single-phase meter testing desk with its associated equipment —portable precision wattmeter, single-phase precision watt-hour meter, and stabilised power unit— will be exhibited on stand C.510 by Metropolitan-Vickers Electrical Company.

Mechanical Handling

Two new products which have been added to the range of mechanical handling equipment made by J. Collis and Sons will be exhibited on stand D.522/623.

The powered RolaVeyor is constructed mainly from the standard gravity roller conveyor and can negotiate gradients where necessary without any form of aid. The other addition to the present range is the telescopic stacker, specially designed to work under low headroom and yet to stack above it if necessary.

Pictures will show the many applications of the MotaVeyor, a versatile belt conveyor of unit construction, and the new waterproof bearings will be exhibited.

*

The products of the gridway division of Fisher and Ludlow will be concentrated on outdoor stand 1322 this year. Part of the site will be laid out as a modern palletised store to demonstrate the Flowstack pallets, stillages, and tote boxes. The rest of the stand will be devoted to the demonstration of works equipment, including unit construction belt conveyors, overhead chain conveyors, gravity conveyors, and a new portable elevator for handling components between machine operations.

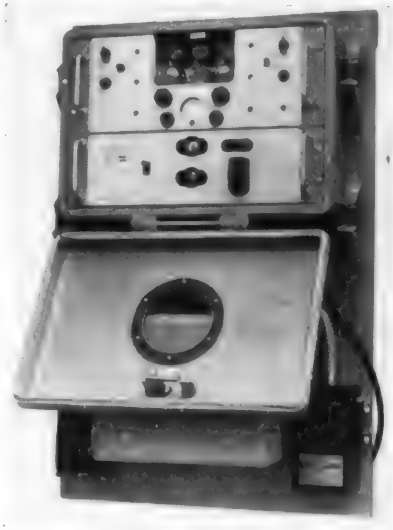
*

A more robust dumper and a loader of greatly increased versatility resulting from additional ancillary equipment, together with Diesel and petrol dumpers of 8 cu. yd. capacity, and the dumper of 6½ cu. yd. capacity, are to be shown by the manufacturers of Muir-Hill equipment, E. Boydell and Co., on stand 1301/1200.

OLYMPIA

Electronic Equipment

The many applications of electronics to research and industry will be demonstrated on stand C.16 where Cinema-Television will exhibit a new range of portable metal detectors, and their industrial electronic metal detector for locating pieces of metal in foodstuffs, plastics, etc.



Industrial electronic metal detector.
Cinema-Television.

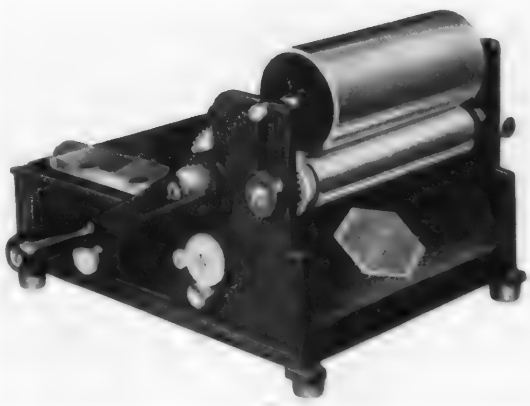
Instruments for research and laboratory use on show will include a universal valve tester, an oscillator with a frequency range of from 10 c/s. to 100,000 c/s., and the microsecond counter chronometer.

Rubber Compounds

Two new types of latex compounds, in addition to pre-vulcanised latex and their range of compounds for adhesives, dipping, can sealing, etc., will be on view at stand B.45. By arrangement with the British Rubber Producers' Research Association, who developed the process in conjunction with the D.S.I.R., Rubber Latex are now able to offer latex anti-corrosion compounds for the protection of metal surfaces against atmospheric corrosion. Another new development is a heat-sensitive compound for the manufacture of latex foam which has the advantage of giving a stable foam at room temperature, gelation being effected only upon heating.

Printing Machines

Three types of printing machines will be featured by Dapag (1943) on stand F.49. The Imprima is a small compact machine with quick typesetting method, which will overprint in one operation all necessary changes of details on labels, tags, and strung and pin tickets. Overprinting of tickets and labels supplied in perforated rolls is performed by the Tickopress machine, which can handle any ticket up to $2\frac{3}{8}$ in. by $4\frac{1}{2}$ in., and produce 150 tickets per minute. Applicable to almost any material, the Langapres portable printing machine prints in all details on cartons, labels, tickets, wood labels, etc., with a single depression of the handle.



The Imprima overprints in one operation all necessary changes of details on labels, etc. *Dapag (1943).*

Flavours and Essences

A range of soluble and fruit essences, concentrated juices, liquid and powder flavours for various types of foodstuffs, culinary flavours and colours, and Combinenes (flavour/colour compounds) will be exhibited by W. J. Bush and Co. on stand B.26. Also harmless food colours for all purposes, natural and concentrated essential oils, vanillin, coumarin, powdered cream of tartar, and food preservatives will be shown.

Office Appliances

Industrial portable cleaners comprising models for the cleaning of offices, factories, etc., and including the vacuum chimney sweeping machine, will be seen on Stand Y.2.

The British Vacuum Cleaner and Engineering Co. have also taken stands No. D.208 and D.102 in the engineering section at Birmingham to show their flue dust extraction plant and sack cleaning plant as well as their industrial cleaners.

■

A wide range of clocks, including large wall clocks, master and slave clocks, and timing systems, is to be exhibited by the Magneta Time Co. on stand F.79 at Olympia. In addition will be shown time recorders, job costers, programme instruments, and the speakerphone and communicator for inter-office communication. Stand No. H.85 will be devoted to Magneta P.A. equipment, amplifiers, and rack assemblies.

Packaging Products

A series of attractive window displays of Butterfly brand products will be seen on stand M.88, where Samuel Jones and Co. are exhibiting.

In the gumstrip section will be featured the Rodney automatic sealing machine and the new tape-shooter; these machines cover the needs of both large and small users.

Noncurling gummed papers and Devonvale coated papers and boards, Heatfix papers, and other special coated and impregnated papers will be shown, and there will be a display of fancy and metal papers for boxmakers' needs.

The new tacky labels are to be demonstrated and, in addition to other adhesives, the Samson Cement is to be introduced.

The Eel comparator for detecting minute differences between samples of whites and off-whites. *Evans Electroselenium.*

Detergents and Wetting Agents

An outsize animated flow chart showing the manufacture of Teepol detergents and wetting agents will be the principal feature of the Shell Chemicals stand B.22; this should attract considerable interest in the chemical section in view of the wide application of these materials in industry.

Tablet Machines

Various models of rotary and single stroke tablet machines as well as a stainless steel mixer and a 10-tray drying oven will be exhibited by Manesty Machines on stand B.12. An oscillating granulator, coating pans, a hand compact press, a drug mill, automatic water stills, and punches and dies will complete the display.

EARLS COURT

Weighing and Filling Equipment

Stand V.9 will be devoted to a typical single unit installation for the handling, weighing, filling, and sealing of 1 oz. packets of potato crisps, together with a typical "take away" conveyor arrangement. The central unit in the display will be a Hy-tra-lec automatic weighing and filling machine manufactured by Industrial Products (Speco). The feeding arrangements, consisting of a hopper feed and conveyor lift, together with a heat sealing machine with its ancillary bag stretching unit and final package conveyor and stacker, are to be provided by two other firms.

The company will also show a new check-weigher for chocolate bars, biscuits, and similar products.

Photo-electric Equipment

Together with the Eel Selenium barrier layer photo-cells on stand C.50 will be seen several new instruments produced by Evans Electroselenium. A portable colorimeter for assessing the colour density of a liquid, and a comparator for detecting minute differences between samples of whites and off-whites, will be shown. Also on view will be an absorptiometer which meets all requirements for chemical analysis and colour measurement of liquids, a reflectance spectrophotometer for providing information on the colour of a flat surface, and a densitometer and reflection head.

BOOKLETS RECEIVED

Entitled *Raw Materials of the Iron and Steel Industry, Petroleum,* and *Animal Feeding Stuffs,* the first three booklets in a new raw material survey series, covering the syllabus of their final examination subject "Raw Materials (Economic and Geographical Survey)," have been published by the Purchasing Officers' Association.

*

A range of electrical thermometers for measuring temperatures, complete with thermo-elements, cables, and accessories to enable them to be used under practically all industrial conditions, is described in a new Negretti and Zambra publication. The instruments are divided into two classes, thermocouple pyrometers suitable for temperatures of up to 1700° C., and electrical resistance thermometers, suitable for temperatures between −200° C. and +540° C.

*

The most salient points to be noted in the choice of colouring material are presented in a booklet entitled *The Selection and Use of Caramel for Colouring,* which has been published by G. Havinden, world distributors for Clark's caramel, in full collaboration with the latter firm's research laboratories.

Some entirely new theories are put forward in this publication, which is the result of intensive research into caramel problems, and endeavour has been made to explain the results in non-technical terms. In addition, separate leaflets have been published on each grade of caramel described in the booklet.

*

A list of about 400 different corrosive or abrasive substances, with an indication against each of the firm's products which have been found in actual practice to give satisfactory service, has been issued by Henry Wiggin and Co.

*

A machine which will cut and deliver moistened sheets of viscose film for wet wraps, new types of heat-sealing machines, a bottle-washing machine which first removes labels, and a soft rubber cap with a pressure-relieving valve, which has been evolved for use as a bottle cap or closure, are mentioned in a recent issue of *Packaging Abstracts.*

Comparisons have been made of the efficiency of fibre and wooden cases for eggs, and among other recent packaging methods are reported plastic coatings to keep eggs fresh, starch coatings for dehydrated carrots to increase their storage life, and oil or plastic coatings for fresh fruit.

*

All new entrants to the staff of British Railways will in future be given, on joining, a booklet entitled *British Railways Welcome You,* explaining the organisation of the industry and the obligations and opportunities of its staff.

The booklet opens with a personal message of welcome from Sir Eustace Missenden, chairman of the Railway Executive; brief chapters follow on policy, organisation, contact with the public, opportunities, conditions of service, welfare arrangements, and other staff matters.

*

A copiously illustrated booklet entitled *Refrigeration for Hotels and Restaurants* covers the application of Prestcold refrigeration equipment to every aspect of the catering trade, ranging from food preservation to ice cream making and beer cooling and storage. Typical installations are shown, and the booklet concludes with illustrations of operations in the manufacture of this equipment.

OBITER DICTA

• Has the right hon. Gentleman ever invited a friend to a calorie intake?—*Mr. Henry Strauss, M.P.*

• Is the right hon. Gentleman aware that Coca-cola is considerably improved by a nip of gin?—*Air-Commodore Harvey, M.P.*

• So you've heard everything? Now this: a Lakeland, Fla., manufacturer is making a new delicacy—chocolate-coated sardines.—*"The Canner," U.S.A.*

• I have been told that the rise in the cost of white pepper is due to the Communists, who are hoarding it and using it as currency. If this is so, I shall buy no more.—*Letter in the "Evening Standard."*

• I am concerned for the housewives and old-age pensioners. The housewife can no longer afford her little drink when she has finished her shopping.—*Mrs. A. M. Nethercott, Uxbridge County Councillor.*

• Seaweed, a Danish scientist avers, contains more growth-promoting vitamins than butter. The next step, we suppose, is to find a wholesome and nutritious substitute for it.—*"The Star," Ontario.*

• It might be said that whisky is whisky wherever it emanates from, but Scotch whisky producers would be sorry if anybody could use the word "Scotch."—*Mr. S. N. Evans,* M.P.

• We feel that young children have sounder ideas about eating than their parents who have simply got used to the feeding habits they were brought up with.—*Mr. Roy Walker, secretary of the London Vegetarian Society.*

• Mrs. Castle: Are not the currants in the shops tending to hang fire because housewives have not the sultanas to mix with them?

Mr. Webb: Perhaps the hon. lady will take me out to see a currant hanging fire.—*Question time in the House of Commons.*

• I am sure that if the European settlers in Tanganyika and especially Kenya knew that such a disgusting state of affairs existed whereby natives are invited to tea, they would take progressive action to put an end to such things.—*Correspondent to "Our World," journal of the Overseas Food Corporation.*

Company News

The highest output ever achieved in the company's history was reported by Lt.-Col. Lord Dudley Gladstone Gordon, D.S.O., M.I.Mech.E., in his statement at the fifty-first ordinary general meeting of J. and E. Hall.

During the year ended September 30, 1949, thirty-nine major refrigerated ships of 50,000 cu. ft. storage space and over were completed, and three large chilled meat ships were commissioned. Considerable progress had been made in the development of quick freezing plants for shipboard use, including fish treatment, and a large number of trawlers had been equipped with plants.

Although the demand for plants for quick freezing of fish had fallen off, important orders for this purpose had been received. The heavy crop of hard fruit had resulted in a great increase in orders for cold storage plants, and twelve important plants were ordered by the dairy industry during the year.

A final dividend of 7½ per cent. (making a total ordinary dividend of 10 per cent. for the year) less income tax was recommended.

World Food News

Whaling Station for Ireland

An Irish-Norwegian whaling station is to begin operations at Elly Bay on the west coast of Ireland in the summer of 1951. The new company will be called Irish Whaling Company, and the Norwegian Trade Ministry has given permission for equipment to be transferred from a whaling station in Norway.

The whaling boats to be attached to the station in Ireland will be manned by Norwegians, while about twenty-five Norwegians and about seventy Irishmen will work at the station itself, which will have a capacity of 225 to 250 barrels of whale oil a day.

Competition from Kenya

Kenya is going into world competition with the American pineapple canning industry. This was announced recently by Major Edward Beddington Behrens, M.C., one of the two men behind the scheme, on his return from a ten-day flying visit to Kenya to supervise the first trial run of a new cannery near Nairobi. The company concerned, Kenya Canners, whose chairman is Mr. T. B. West of Pickering and West, have given a guarantee to the Kenya Government that they are prepared to quadruple the size of their plant if the raw material is made available, and also to organise the marketing of the product on a world-wide basis.

In order to encourage farmers to grow more pineapples the company have undertaken to buy unlimited quantities. Farmers have responded by producing thirty times their usual crop in the present season. The Kenya Government is co-operating by training native labour in the selection and picking of the fruit when it is ripe.

The type of pineapple grown in Kenya is called Cayenne and is stated by experts to be equal to the world's best and far superior to that grown in other parts of the Empire. The pineapples will be sliced in rings and canned by the most up-to-date methods available. The first consignment will reach Britain in the early summer.

By 1952, the year Marshall Aid ends, it is hoped that production will be at the rate of 20 million cans a year, most of which will be sold in the Canadian and other hard currency markets.

Decrease in Pepper Production

The war in Indo-China has led to an appreciable decrease in pepper production. Before the war pepper culture covered about 650 acres; this total has now dropped by about half.

Exports amounted to 1,250 tons, which is less than pre-war, and a further drop is expected.

Fruit Juice Congress

The second International Congress of Fruit Juice Producers is to take place in Zurich, at the Congress House, from June 1 to 4, 1950.

After the opening of the Congress, reports will be given on the hygienic and therapeutic value of fruit juices. On the second day a report on the oxidising phenomenon in the preparation and preservation of fruit juices will be followed by a discussion. The afternoon will be devoted to tasting, with brief reports by a specialist in the production of each kind of juice submitted. An official banquet will be held in the evening.

Reports of the steps to be taken to further the development of production and consumption of fruit juices will be given on the last day, after which the closing ceremony and voting on the resolutions will take place.

Frozen Pineapples from Mexico

Mexican pineapple growers are in a position to send abroad large quantities of their produce, and experiments are at present being made with the export of frozen pineapples from Vera Cruz. If the experiment is successful a large number of the pineapples produced in south-eastern Mexico will pass through this port in 1950.

Targets for Food Production

As part of a widened effort by FAO to co-operate with governments in formulating development programmes for the main agricultural products, Alfredo Saco, agricultural economist of the Organisation, has begun a four-month field assignment that will take him to eight Latin-American countries.

A Peruvian, Mr. Saco was formerly chairman of the Agricultural Committee of the Chamber of Deputies, and also chairman of the National FAO Committee in Peru. Countries to be visited are Mexico, Colombia, Venezuela, Brazil, Chile, Uruguay, Puerto Rico, and Cuba.

Agricultural economists are also being sent to help governments in other regions develop similar programmes for food and agriculture.

The stand of the Chase Equipment Corporation, associates of The Automatic Weighing and Packing Machine Co., at a recent chemical show in New York.

Thermometer control ensures safe temperatures in self-service meat counters.

Serve Yourself with Meat

A serve-yourself meat counter is a novel feature of the new Kroger supermarket in Toledo, Ohio. A series of compact, Auto-Lite indicating thermometers are installed on standard refrigeration equipment so as to provide a constant temperature check for store personnel, and reassure customers that meats are kept at proper temperatures.

The meat is specially wrapped by trained personnel and the weight, price, and type of cut can be seen at a glance.

Australian Food for Britain

Great Britain will import more than £A3,000,000 worth of Australian processed foodstuffs under the 1950 miscellaneous foodstuffs import programme, it is reported by the Australian Department of Commerce. The main items and their cost are as follows: Christmas puddings £A625,000; canned apples £A625,000; table jellies £A125,000; mincemeat £A187,500; lemon butter £A187,500; peanut butter £A187,500; and fruit cake £A937,500.

Other items included are: dessert powder; apple-pie mix; custard and blancmange powders; cornflour; mayonnaise; and solid cream.

Allocations for Australian exporters and manufacturers will be determined later by the Department and import licences will be issued by the British Ministry of Food to U.K. importers nominated by the Australian exporters.

U.N. Fish Canning Conference

The United Nations are planning a conference to find ways of improving fish canning, according to Mr. A. H. Boerma, Dutch leader of the Food and Agriculture Organisation Study Group.

The conference will discuss possible methods of conserving fish for export to distant markets, particularly in the Far East where fish is scarce. It is proposed that it should be held in Bergen, possibly next September.

The study group, comprising eight experts in various spheres, spent four days in Norway conferring with Norwegian experts and Government representatives.

Cashew Nut Factory

A factory for the extraction of varnishes and natural oils from the shells and kernels of cashew nuts, which are produced in large quantities in Mozambique, is to be established in Lourenço Marques.

A new scientific decortication process will be used for separating the nuts from their shells; this not only enables rapid working but also ensures that the shells and nuts maintain their high oil content.

A second factory may also be built in the north of the colony, and together these factories should have a capacity of 50,000 tons a year. The estimated yearly harvest of cashew nuts in Mozambique is between 70,000 and 90,000 tons, at present almost entirely exported to India for decortication.

America's Pre-peeled Potatoes

A transparent polyethylene bag to maintain the freshness of specially processed pre-peeled potatoes is now being marketed.

The potatoes are automatically peeled and washed, removal of the eyes and trimming being carried out by hand. The peeled potatoes are then put through a preservative solution and carried by conveyor to the weight filling machine.

Made in 5 lb. and 30 lb. sizes, the bags are check weighed after filling, the tops being stitched, gathered, and tied prior to distribution.

Glycerine in Foods

Combining technical data of concern to the chemist, with interesting facts about usage for the non-technical user, the booklet *Why Glycerine For Foods?*, published by the Glycerine Producers' Association, contains information regarding the uses of U.S.P. glycerine in handling and preparation of many types of foods and beverages.

Covering the food industry from baby foods to nut treating, this new twenty-page work outlines the general reasons for glycerine's use in foods and food products, and in text, tables, and charts gives further information as to its physical and chemical properties, origin, and usage. Included are tables of specific gravity, viscosity, freezing point, etc., of aqueous glycerine solutions at various concentrations, and a bibliography of references.

Approved Dyestuffs in S. Africa

The South African Bureau of Standards has prepared a list of synthetic dyestuffs which have been approved for use in food preparation. Food manufacturers are advised to use only those dyes which have the approval of the Standards Council, but they are under no obligation to do so, except in the case of all food products manufactured in accordance with the South African Bureau of Standards specifications, and bearing its stamp of approval.

The Bureau is prepared to consider additions or amendments to the list which may be suggested from time to time.

Copies of the approved list can be obtained from the South African Bureau of Standards, Private Bag 191, Pretoria, on payment of 1s. 6d.

DOLLAR ENQUIRIES

Marmalade, Sauces, and Ale

It is understood that United Grocers, Ltd., 685, Sixth Street, San Francisco, are interested in making direct imports from the United Kingdom of marmalade, sauces, ale, soups (dehydrated or otherwise), preserves, and confectionery.

U.K. firms interested in this enquiry are requested to communicate direct with the San Francisco firm quoting c.i.f. prices in U.S.A. currency.

▪

Bakery and Other Equipment

The Commercial Officer to the British Consulate at Denver, Colorado, has reported that the W. H. Bintz Co., of Salt Lake City, Utah, would be interested in receiving offers from United Kingdom manufacturers of bakery, restaurant and hotel, and dairy processing supplies and equipment (but not farmers' material).

United Kingdom manufacturers of suitable goods who are interested in this enquiry should write direct to the W. H. Bintz Co., 433 West 3rd South, Salt Lake City, Utah, U.S.A., quoting prices in U.S. dollars, c.i.f. the commonly used U.S.A. East and West coast ports.

▪

Continuous Deodoriser

The United Kingdom Trade Commissioner at Kingston, Jamaica, has been approached by Kingston Industrial Agencies, 1, Darling Street, Kingston, Jamaica, regarding their desire to be placed in touch with a United Kingdom manufacturer of a continuous deodoriser for oils and fats.

It is understood that the usual process of deodorising is done by transfer of the matter to be processed through a series of vessels, but in the continuous deodoriser the whole process is carried out in a single unit.

United Kingdom manufacturers interested in this enquiry are invited to communicate with Kingston Industrial Agencies.

▪

Sugar Beet Plant

The United Kingdom Trade Commissioner at Winnipeg reports that Mr. E. L. Gray, Superintendent of Water Development, Department of Agriculture, McCallum Hill Building, Regina, Saskatchewan, wishes to obtain catalogues from United Kingdom manufacturers able to supply small sugar beet plant. It is understood that Mr. Gray is making his enquiries on behalf of a group of irrigation farmers, and that an initial installation might mean an order for a number of such installations.

Interested United Kingdom firms are invited to send literature direct to Mr. Gray at the above address, together with c.i.f. dollar prices (where possible) and details of delivery.

▪

Chocolate Bars

The United Kingdom Trade Commissioner at Vancouver reports that Mainland Tobacco Wholesale, Ltd., 746, Richard Street, Vancouver, B.C., are interested in obtaining a United Kingdom source of supply of chocolate bars to retail in Vancouver. It estimates the amount of business possible at over $5,000 a month.

As a guide to price quotation, it is stated that the wholesalers' price for chocolate bars to be retailed at 5 cents is 81 cents per box of twenty-four, to which must be added the agents' commission of 10 per cent.

Any firms interested in this enquiry should approach the Canadian firm direct, quoting prices c.i.f. in Canadian currency.

▪

Cocoa Butter

The United Kingdom Trade Commissioner at Montreal reports that Harrisons and Crosfield (Canada), Ltd., 297, St. Paul St., W., Montreal, a subsidiary of a United Kingdom firm, wish to receive offers of cocoa butter direct from United Kingdom producers.

The Commissioner also reports that James Tellier, Ltd., 421, St. Dizier Street, Montreal, wish to receive samples of edible gelatins, 150 to 250 Bloom strengths, with a view to buying occasional lots of 20 to 25 tons.

Any firms interested in these enquiries are invited to write direct to the concern in question quoting prices c.i.f. in Canadian currency.

German Fatty Acids Plant

The first plant for the manufacture of fatty acids in Schleswig-Holstein is to be erected in Üterseen with U.S. assistance.

Food Technology in U.S.

DEVELOPMENTS IN INSTITUTE'S PROGRAMME

A three weeks' intensive course in food technology, which will lay particular emphasis upon recent developments in food manufacture and control, is to be held by the Massachusetts Institute of Technology from June 12 to 30 this year. In addition to lectures, demonstrations, and conferences there will be opportunities for group visits to representative food industries throughout greater Boston.

Intended principally for those having some knowledge of the basic sciences pertinent to food technology, the course should prove valuable to advanced students in other sciences as well as to executives and employees in food industries.

The following subjects are among those on which the course will include fundamental material: economics and statistics of food supplies; food cost accounting and business law; food bacteriology, sanitation, and fermentation; food chemistry and nutrition; materials handling; food control instrumentation; flavour and food acceptance; and food sterilisation by electronics. Detailed studies of bakery operations, canning, food freezing, meat packing, milling, and yeast operations will be among several special food processing reports.

A grant of $1,000,000 to the Institute was recently made by the Campbell Soup Company for the purpose of supporting the Institute's research programme in the fields of biology and food technology and in related scientific and engineering subjects.

This is one of a group of industrial grants to the Institute now totalling over $4,000,000 under a plan whereby the Institute extends to the companies full opportunities to keep abreast of new developments and trends in science and technology.

As part of their development programme, the Institute are to construct a new building to house the departments of biology and food technology; this building will be named in memory of John Thompson Dorrance, who from 1914 until his death in 1930 was President of the Campbell Soup Company.

News from the Ministries

Boxed Fresh Fish

Following the decision to revoke the Fish (Maximum Prices) Order, 1948, on April 15, 1950, the practice of regulating the quantities, varieties, and sizes of boxed fresh fish imported each week under open general licence has been discontinued as from March 25, 1950.

There will now be no regulation of the import of boxed fresh fish from Denmark, the Republic of Ireland, the Faroes, France, Holland, Iceland, Norway, Poland, Spain, and Sweden.

Dried Egg for Bakers

Approximately 14,200 tons of dried whole egg, for distribution later in the year to bakers and manufacturers, have been purchased from the United States of America through the Commodity Credit Corporation. This dried egg will be of particular value to small bakers who find difficulty in using frozen whole egg.

Last September the U.S.A. undertook to reimburse, out of Marshall Aid Funds, U.K. expenditure on Canadian wheat to a total of $175 million. At the same time the U.K. agreed to spend from $8 to $10 million upon perishable agricultural surpluses in the U.S.A. The expenditure on dried egg will form part of this sum: a substantial proportion of the dollars required to meet it will be provided out of the funds of the Economic Co-operation Administration.

Stockfeed Molasses

The Feedingstuffs (Licensing) Order, 1950, has been amended with effect from April 1, 1950.

Under the amending Order, traders who have hitherto been licensed to trade in stockfeed molasses by the Board of Trade under the Molasses Order, 1949, and have therefore been exempted from the need to hold a licence issued by the Ministry of Food under the Feedingstuffs (Licensing) Order, 1950, will now be required to hold such a licence. This is because the Board of Trade licences are no longer valid owing to the revocations of the Molasses Order on April 1, 1950. The traders concerned have already been notified.

The amending Order also makes a minor alteration in the definition of the term "consumer."

Prices of Cattle Tripes

The prices charged on certain sales of unprocessed cattle tripes, etc., sold for human consumption from Government slaughterhouses have been reduced. The revised prices came into operation on March 25, 1950.

Milk Regulations

The following Regulations came into force on March 26, 1950:

1. Milk (Special Designation) (Pasteurised and Sterilised Milk) (Amendment) Regulations, 1950 (made jointly by the Minister of Health and the Minister of Food); and

2. Milk (Special Designation) (Raw Milk) (Amendment) Regulations, 1950 (made jointly by the Minister of Health, the Minister of Agriculture and Fisheries, and the Minister of Food).

The effects of the amending Regulations are:

(*a*) a small technical error in the section of the Milk (Special Designation) (Pasteurised and Sterilised Milk) Regulations dealing with the method of carrying out the turbidity test for sterilised milk is corrected; and

(*b*) provision is made in both sets of Regulations for the use of sterilised glass-distilled water and sterilised stoppered flasks in connexion with the methylene blue test.

Fish Distribution Offices

The Port and Area Fish Distribution Offices at 23A, Cromac Street, Belfast; 15, The Esplanade, Paignton, Devonshire; and The Docks, Milford Haven, Pembrokeshire, closed down on March 31.

All official enquiries about distribution of fish at the ports concerned should now be addressed to the Ministry of Food, Fish Division, Carlton Hotel, Pall Mall, London, S.W.1.

On April 1, 1950, the Port Fish Agents' Offices at Belfast and Milford Haven removed to the following addresses to which all communications about fish transport changes should now be sent:

Northern Ireland: Port Fish Agent's Office, Regional Food Office, 7, Upper Queen Street, Belfast.

South Wales and South West of England: Port Fish Agent's Office, 97, Exchange Buildings, Adelaide Street, Swansea.

Dried Figs

The Dried Fruits Order, 1949, has been further amended, with effect from April 9, 1950, so as to remove dried figs from price control and the other provisions of the Order.

Animal Feedingstuffs

Following the Government's decision to remove the remaining subsidy on feedingstuffs, the Minister of Food has made the following Orders which came into force on April 1, 1950, and will increase the maximum prices of most animal feedingstuffs:

1. The Feedingstuffs Prices Order, 1950.

2. (*a*) The Barley (Great Britain and Northern Ireland) (Amendment) Order, 1950.
   (*b*) The Dredge Corn (Great Britain and Northern Ireland) (Amendment) Order, 1950.
   (*c*) The Oats (Great Britain and Northern Ireland) (Amendment) Order, 1950.

3. The Milk Powder (Prices) (Amendment) Order, 1950.

Vegetable Oils

While imports of certain vegetable oils, including teaseed oil, are at present admitted under open general licence from selected countries, there have been recent instances of imports of oil described as "teaseed oil" which, on analysis, has been found to contain an admixture of other oils, such as groundnut oil, coconut oil, palm oil, or palm kernel oil. Such mixtures are not covered by the open general licence and are, moreover, subject to restrictions on sale under the Oils and Fats (No. 2) Order, 1949.

Hitherto, the Ministry of Food has given authority for shipments of mixed oil imported in good faith as teaseed oil to be disposed of through ordinary commercial channels. The Ministry now announces that such authority will not be granted in respect of any future imports and that special arrangements are being made, in collaboration with H.M. Customs and Excise, to verify that goods entered as teaseed oil fully conform to that description.

Fishing Deputation

The Minister of Agriculture and Fisheries, accompanied by the Secretary of State for Scotland and the Minister of Food, recently received a deputation from the trawler fishing industry. The deputation placed before the Minister their grave concern about the future of the British fishing industry and in particular their desire that there should be some curtailment of the import of foreign caught fish. The Minister undertook to consider the points raised.

Allocations of Fat

When the increased allocations of fat for the manufacture of cakes and flour confectionery and biscuits were announced, the Ministry of Food stated that it was also prepared to consider applications for an additional amount of fat from bakers whose allocations for cake and flour confectionery fell short of the new average of 60 per cent. of datum usage.

The Minister has since decided that no manufacturer of flour confectionery shall receive less than 60 per cent. of the quantity of fat which he used during the datum period. To give effect to this decision supplementary permits are being issued, where necessary, for the sixteen-week period dating from February 26.

Sugar-fat from France

The block licensing arrangements announced on December 29, 1949, for the importation of sugar-fat mixtures from Czechoslovakia, Denmark, Faroe Islands, Holland, the Republic of Ireland, Norway, and Sweden, have now been extended to Metropolitan France.

The necessary arrangements with H.M. Customs and Excise have been made. Importers who already hold appropriate licences will be allowed to import sugar-fat from France without amendment to their licences.

Importers who are not already in possession of the appropriate licences should submit an application (in duplicate) on form ILD/A obtainable from the Board of Trade, Import Licensing Department, Romney House, Tufton Street, London, S.W.1, or from the usual Customs Offices. For administrative convenience, importers are asked to send such applications to the Board of Trade through the Ministry of Food, Miscellaneous Foods Division, 6/10, Sussex Place, London, N.W.1.

Fruit Pulp and Preserves

As supplies of fruit pulp are now plentiful, the importation of fruit pulp on Government account will cease and the manufacture of fruit pulp will be decontrolled. The price controls remaining on certain preserves will also be removed.

Arrangements are being made to enable private traders to import fruit pulps from certain countries under open general licence as from June 1 next. In the meantime stocks of imported fruit pulp held by the Ministry of Food will be offered for sale to any purchaser. Particulars of varieties available can be obtained on application to the Ministry of Food, Fresh Fruit and Vegetables Division, Fruit Pulp Branch, 24/32 York Terrace, Regent's Park, N.W.1.

The Orders revoking the Fruit Pulp Order, 1948, and the Preserves Order, 1947, came into effect on April 5. This completes the decontrol of prices of preserves, *i.e.* jam, marmalade, mincemeat, fruit curd, imported honey, and imitation honey. Also from that date licences will no longer be needed for the manufacture of fruit pulp and preserves, or for the packing of preserves. The Food Standards (Preserves) Order, 1944, will still apply and preserves must continue to be labelled in accordance with the Labelling of Food Order, 1946.

Shredded Suet

As a result of the revocation of the Shredded Suet Order, 1949, as from March 18, price control of shredded suet has ended and licences are no longer needed for the manufacture or prepacking of shredded suet.

This commodity remains subject to the provisions of the Food Standards (Shredded Suet) Order, 1944.

Prevention of Damage by Pests

DUTIES OF FOOD HANDLERS UNDER ACT

The Prevention of Damage by Pests Act, 1949, which came into force on March 31, makes new permanent provision in Great Britain for the control of rats and mice and for the prevention of damage to food by rats, mice, insects, or mites.

Local authorities are made responsible for seeing that their districts are kept as free as possible from rats and mice, and they are given power to require owners or occupiers of premises to take action to destroy or prevent the intrusion of rats and mice. In order that the local authorities may be kept informed of the prevalence of such pests in their districts, occupiers are required under the Act to notify their local authority in writing whenever they discover substantial numbers of rats or mice on their land or in their premises. This particular requirement does not apply to occupiers of agricultural land, nor to persons required to give notice to the Minister of Agriculture and Fisheries or, in Scotland, to the Secretary of State in connexion with infestation of food.

Every person whose business includes the manufacture, storage, transport, or sale of food or food containers must, unless specifically exempted under the Prevention of Damage by Pests (Infestation of Food) Regulations, 1950 (S.I. 1950, No. 416), give notice in writing to the Minister of Agriculture and Fisheries or, in Scotland, to the Secretary of State, whenever he becomes aware of a risk of substantial damage to food owing to the presence of rats, mice, insects, or mites in premises, vehicles, equipment, food or other goods, or food containers in his possession or control in connexion with the business.

Notices to the Minister of Agriculture and Fisheries in respect of infestation on non-agricultural premises should be sent to the area office of the Infestation Inspectorate or to the Infestation Control Division, Ministry of Agriculture and Fisheries, 58, High Holborn, London, W.C.1; notices in respect of agricultural premises should be addressed to the appropriate County Agricultural Executive Committee. Notices to the Secretary of State for Scotland should be sent to the Department of Agriculture for Scotland, Infestation Control, at 69, Berkeley Street, Glasgow, C.3, or at 1, Douglas Crescent, Edinburgh, 12.

When a notice is sent in respect of infested food or other goods, the food or goods must not be moved for three working days after the date of notification, except with the consent of the Minister. In order to avoid or mitigate damage to food, the Ministers are empowered to issue directions for remedying infestation and for preventing its spread.

Anglo-Polish Trade in 1950

LARGE IMPORTS OF POLISH FOODSTUFFS

Talks between a U.K. and a Polish Trade Delegation, which were held to review the course of trade between the United Kingdom and Poland in the first year of the five-year Trade and Finance Agreement of January 14, 1949, and to agree arrangements for 1950 within the framework of that Agreement, have recently been concluded.

Polish exports of foodstuffs to the United Kingdom under Article 1 of the Agreement will include increased quantities of bacon and eggs, and may reach a total value of £16 million. These imports will include canned meat and fish, onions, bacon factory products, bilberries, sugar confectionery, chocolate and chocolate confectionery, vodka, canned peas and beans, seasoned meat, and canned ham. As in 1949, an agreed quantity of miscellaneous foodstuffs will also be licensed for import.

Agreement was reached on export and import quotas for miscellaneous manufactured goods in 1950 under Article 7 of the Agreement, amounting to £2·2 million for Polish exports and £1·3 million for United Kingdom exports. The Board of Trade will be prepared to issue import licences for a range of Polish goods including casein, chemicals, wrapping paper, and board. The agreed schedule of United Kingdom goods for which the Polish Government have undertaken to issue import licences includes food machinery, laminated plastic materials, flavouring essences, gelatin, and various chemicals.

In the course of the discussions the question was raised of difficulties experienced by United Kingdom business men in 1949 in obtaining visas for visits to Poland. As a result, all visas for which applications were outstanding have now been granted, and the Polish Government have given assurances that there will be a marked improvement in 1950 in this connexion.

Any difficulties experienced by United Kingdom exporters in trading with Poland should be referred to the C.R.E. Department of the Board of Trade.

Export of Linseed Oil

A limited quantity of processed linseed oil can now be allowed for export. In addition, and in special cases, applications to export raw linseed oil in small quantities will be considered.

Applications for export licences should be made to the Export Licensing Branch of the Board of Trade, Regis House, 43/46, King William Street, E.C.4, to whom all enquiries should be addressed.

Appointments

The Minister of Food has appointed Mr. W. Monslow, M.P., to be his Parliamentary Private Secretary.

He has also appointed Mr. F. A. Bishop as his Private Secretary and Mr. J. Hammond as his Assistant Private Secretary.

*

The Minister of Agriculture and Fisheries has appointed Mr. J. R. Moss to be his Assistant Private Secretary.

*

The Rt. Hon. the Earl of Huntingdon, Parliamentary Secretary to the Ministry of Agriculture and Fisheries, has appointed Mr. A. Savage to be his Private Secretary.

Chocolate Imports

Chocolate and sugar confectionery and chocolate couverture may now be imported from Denmark and Israel under the block licensing arrangements previously announced.

No alteration is necessary to block licences already held by importers. All enquiries should be addressed to the Cocoa, Chocolate, and Sugar Confectionery Division, Ministry of Food, London Road, Stanmore, Middlesex.

Import of Marzipan

Arrangements have been made for the importation under individual licence of a limited quantity of marzipan from France and Denmark.

The marzipan will be imported through normal trade channels. Applications for import licences should be made in duplicate on the usual form ILD/A, obtainable from the Board of Trade, Import Licensing Department, Romney House, Tufton Street, S.W.1. For administrative convenience, completed application forms should, in the first instance, be submitted to the Bakery Division of the Ministry of Food, London Road, Stanmore, Middlesex.

The marzipan to be imported under these arrangements should consist of ground almond kernels and sugar only, and the almond kernel content must be at least 20 per cent. The unqualified description "marzipan" may be applied only where the percentage of almond is not less than 66⅔ per cent. In all other cases the word "marzipan" should be qualified by the addition of the actual percentage of almond kernels in the mixture, *e.g.* marzipan (40 per cent. almonds). Applications for import licences should be endorsed with the following information:

(*a*) Prices f.o.b. and c.i.f.

(*b*) Composition of the marzipan, *i.e.* percentage of sugar and almond kernels.

(*c*) Type, size, and weight of pack.

Grists and Imported Flour

Grists for breadmaking in England and Wales were altered on March 27, 1950, to:

65 per cent. Manitoba wheat (maximum).

15 per cent. home-grown wheat (minimum).

20 per cent. other imported wheats, including French wheat, as available.

No alterations have been made in the grists for Scotland and Northern Ireland.

As from that date, the rate of admixture of imported flour was reduced from 10 per cent. to 7½ per cent. in all mills in England and Wales, and from 15 per cent. to 12½ per cent. in all mills in Scotland and Northern Ireland. As before, these percentages relate to the total product containing admixed flour.

Prepacking of Soya Flour

Applications for licences, under the Soya Flour (Control and Maximum Prices) Order, 1946, as amended, authorising the prepacking of soya flour for sale within the maximum prices prescribed by the Order, will now be considered by the Ministry of Food, and should be forwarded to the Cereal Products Division, Block "B," Stanmore, Middlesex, as soon as possible.

Traders are reminded that labels on all prepacked foods must comply with the Labelling of Foods Order, 1946. The Ministry is prepared to advise on labels and descriptions, and manufacturers and prepackers are invited to submit specimens of their proposed labels to the Food Standards and Labelling Division of the Ministry, 47, Portman Square, London, W.1, for examination.

Information and Advice

Marshmallow Substitute

B.4163. *What ingredients are required for the manufacture of substitute marshmallow suitable for filling biscuit cones?* (Lancs.)

The only ingredients required to make a substitute marshmallow suitable for filling biscuit cones are:

Grape juice or honey, cooked to 240° F.
Powdered gelatin.

The gelatin is dissolved in the batch, after the heat has been turned off, and the mixture is cooled to about 100° F. It is then well whisked, and filled into the cones.

Sugared Almonds

B.4196. *Can you give me details of a method for coating almond nuts with sugar?* (Malayan Federation.)

The following method is submitted as a basis for trial:

	lb.
Almonds	94½
Gum arabic	1¾
Flour	3¾

The almonds are cleaned thoroughly, and all dust, broken pieces, etc., are removed. The almonds should then be dried in slight warmth overnight, care being taken that the heat is not sufficient to split the skins or to cause the oil to sweat. The gum is dissolved in hot water, a pint to the pound, and strained. The almonds are placed in a cool revolving pan and coated with the warm gum. To prevent sticking a light coating of flour is applied and the pan is warmed slightly to assist drying. The process is continued until the surface irregularities are filled up and the nuts are well sealed and thoroughly dry. The sugaring process follows, using a heavy sugar syrup (about 38° Bé., at 212° F.), until a good hard coating is obtained, using small quantities of icing sugar to fill up any pinholes that may develop. The pan should be warm and the syrup not much hotter, or the casings will split. The goods should be covered thoroughly at each charge of syrup and allowed to run until they begin to dust before the next charge is applied. As the work proceeds the density of the syrup is lowered. The final polishing coats, which may include the necessary colour, should have a density of about 30° Bé. The total amounts of syrups required will naturally depend on the proportion of almond to covering required in the finished article, and therefore no definite weights for this are given.

Information Supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery, and materials, and also general information as follows:

B.4055. *Labelling machinery for oval herring cans.* (London.)
B.4058. *Carton making machinery.* (Warwicks.)
B.4059. *Extruding machinery.* (Yorks.)
B.4061. *Roasting chickens.* (London.)
B.4062. *Tea milling machinery.* (Lancs.)
B.4063. *Preparation of salted nuts.* (Yorks.)
B.4064. *Machine for breakfast cereal manufacture.* (India.)
B.4066. *Roasted and salted peanuts.* (London.)
B.4068. *Glyceryl monostearate.* (Australia.)
B.4070. *Cooling trays for slab jelly.* (Ireland.)
B.4074. *Bread wrapping machinery.* (Ireland.)
B.4076. *Meat curing powder.* (Scotland.)
B.4077. *Celery salt.* (Sweden.)
B.4078. *Machine for perforating the edge of guarantee slips.* (Lancs.)
B.4079. *Onion skinning machine.* (Australia.)
B.4080. *Cherry pitting machine.* (Australia.)
B.4081. *Use of copper boilers for sugar syrups.* (Ireland.)
B.4082. *Storage of cognac and wines.* (Africa.)
B.4084. *Vegetable/fruit juice extractor and grating machine.* (Lancs.)
B.4085. *Peppermint lozenges.* (Lancs.)
B.4086. *Meat and fish pastes.* (Durham.)
B.4089. *Sandwich spread.* (London.)
B.4091. *Tank linings.* (Warwicks.)
B.4093. *Canned vegetables, fruit, and meat.* (London.)
B.4094. *Machinery for the ring type of doughnut.* (India.)
B.4099. *Continuous roller towels.* (Somerset.)
B.4105. *Liquid meters.* (Northumberland.)
B.4111. *Electric frier suitable for sausages.* (Lancs.)
B.4113. *Dough divider.* (Lancs.)
B.4116. *Machine to produce salt spills and weighing machine for potato crisps.* (Staffs.)
B.4117. *Shelled nuts, machinery for roasting and blanching, Cellophane bags, and machinery for heat-sealing bags.* (Scotland.)
B.4118. *Ice cream powder.* (India.)
B.4119. *Puffed and flaked cereals and colloid mills.* (Norway.)
B.4120. *Kapok wool.* (Kent.)
B.4122. *Moulds and cutters for jellies.* (Herts.)
B.4123. *Crystalline vitamin B_1.* (Berks.)
B.4128. *Packing machines.* (Ireland.)
B.4129. *Monosodium glutamate.* (Bucks.)
B.4132. *Shelled hazel nuts.* (Ches.)
B.4145. *Whipping cream for bakers.* (Lancs.)
B.4147. *Mixing machines, filling machines, colourings, and seasonings for fish paste.* (Yorks.)
B.4148. *Dinner wagons.* (Lancs.)
B.4149. *Vacuum packing equipment.* (London.)
B.4150. *Electric pig scribing machine.* (Scotland.)
B.4153. *Iced lollies.* (London.)
B.4154. *Nut blanching machinery.* (Australia.)
B.4155. *Popcorn machinery.* (Germany.)
B.4156. *Jelly cutting machines.* (Ireland.)
B.4157. *Kola extract.* (London.)
B.4158. *Autoclaves.* (Durham.)
B.4162. *Machine for shredding fat.* (London.)

Recent Patents

635,403. Express Dairy Co., Ltd., Weston, P. G., and Arnison, E.: Egg candling devices.
635,437. Controlled Heat and Air, Ltd., and Macmillan, R. D.: Drying ovens.
635,447. Peacock and Son, Ltd., R. A., and Melvin, W. C.: Apparatus for use in coating biscuits, cakes, and the like.
635,571. Aktiebolaget Separator: Process for refining vegetable and animal oils.
635,755. Steenberg, A. C.: Method and apparatus for cleaning chocolate moulds.
635,775. Bristol Aeroplane Co., Ltd., Whitehead, F. W., and Bedford, W. H.: Grinding, milling, or the like machines.
636,022. Rudman-Darlington and Co., Ltd., and Rudman, J.: Device for use in removing screwed and other closures from bottles, tins, and other containers.
636,092. Fielden (Electronics), Ltd., and Witcombe, L.: Control of drying machines.
636,100. McRobert, J. L.: Device for separating stones and rubbish from potatoes.
636,111. Fisher and Ludlow, Ltd., and Orwin, O. J. B.: Conveyors.
636,219. Latini, L., and Latini, E.: Candy moulding machines.
636,269. Midland Metal Spinning Co., Ltd., and Webster, F. P.: Coffee percolators.
636,445. Armstrong, N. F., and Tweddell, J. A.: Labelling machine.
636,471. Omsted, K.: Apparatus for sterilising by heating and subsequent cooling of food in closed receptacles.
636,482. Imperial Chemical Industries, Ltd., and Talbot, G. W.: Bag filling and weighing machines.
636,550. Bayer Products, Ltd., Brown, W., and Mellor, H. C.: Method of preservation of potato tubers and preparations therefor.
636,566. Reppisch-Werk Akt.-Ges., and Pieper, W.: Potato peeling machine.

Abstract of a Recent Specification

Apparatus for Conditioning Chocolate

The invention relates to methods of and apparatus for tempering or conditioning melted chocolate for dipping, spreading, coating, and similar operations. The most important step in this conditioning process is that of cooling the chocolate to the desired temperature, but when a true tempering of the chocolate is to be achieved, it is also necessary to include a heating step at about the end of the conditioning operation.

The various forms of apparatus heretofore used for cooling this material have depended on bringing the chocolate into contact with cooling surfaces. In all such apparatus it is necessary to scrape the cooled chocolate from these surfaces, and a serious objection to this type of apparatus is that the chocolate tends strongly to congeal not only on the cooling surfaces but also on the scrapers. This action makes it necessary to shut down at frequent intervals and clean up the whole apparatus.

A further difficulty experienced in using prior forms of chocolate cooling apparatus is that the crystallisation of the chocolate, which occurs when it congeals, introduces highly objectionable variations in the consistency of the final product.

The present invention aims to improve both the methods of cooling chocolate and also the apparatus for performing this operation with the object of overcoming the foregoing objections.
631,129. *J. W. Greer Company.*

Recent patents have been selected from the "Official Journal of Patents" and are published by permission of the Controller of H.M.S.O.

Trade Marks

HAYSSEN.—668,238. Bread wrapping machines, bread slicing machines, and package wrapping machines. **Hayssen Manufacturing Co.** (a company incorporated under the laws of the State of Wisconsin, United States of America), 1305, Street, Clair Avenue, Sheboygan, State of Wisconsin, United States of America; Manufacturers.
BREKKIES.—680,384. Cereals prepared for food for human use. **E. Griffiths Hughes, Limited,** Peru Street, Adelphi, Salford, Manchester; Manufacturing Chemists.
DISTRIPOL.—680,400. Edible oils and edible fats; and emulsions of edible oils and edible fats for use as ingredients in food. **Marchon Products, Limited,** "Rylstone," Holders Hill Crescent, Hendon, London, N.W.4; Chemical Manufacturers.
DANOBIS.—681,245. Non-medicated sugar confectionery. **Jack Leslie Clark,** Woodlands, Perry Street, Billericay, Essex; Merchant.
RED ROSE COFFEE.—681,318. Coffee. **John Warr Pollitt,** trading as **J. W. Pollitt and Co.,** 23, Caunce Street, Blackpool; Merchant.
GOLDEN BOUGH. — 681,684. Nuts (fruits). **Alfred Max Landauer, Bernard Landale, William Thomas Hammond, Kenneth Landale,** and **William Charles Hammond,** trading as **Landauer and Company,** "Golden Bough House," 39, Eastcheap, London, E.C.3; Merchants.
FUDGSICLE.—682,323. Non-medicated fudge confectionery, ice confections, and ice cream. **Joe Lowe Corporation** (a corporation organised and existing under the laws of the State of Delaware, United States of America), 601, West 26th Street, City and State of New York, United States of America; Manufacturers.
SHIES.—682,859. Non-medicated confectionery. **Mars, Limited,** Dundee Road, Slough, Buckinghamshire; Manufacturers.

Trade marks have been selected from the "Official Trade Marks Journal" and are published by permission of the Controller of H.M.S.O.

New Companies

Canning Francis, Limited. (476736.) 65, London Wall, E.C.2. To carry on business of confectioners, etc. Nom. cap.: £2,000 in £1 shares. Dirs.: to be appointed by subs. Subs.: W. A. C. Henderson, 1, Redston Road, Hornsey, N.8 (clk.); C. K. Metcalfe, 1, Brondesbury Park, N.W.6 (solr.).

Ferguson Fruit and Vegetable Buying Organisation, Limited. (476751.) Nom. cap.: £500 in £1 shares. Dirs.: A. S. Rickwood, Victoria House, Chatteris, Cambs.; R. B. Smith, 51, Charter Road, Woodford Green; P. H. Thurgood and P. F. Ferguson.

C. E. Dowell (Butchers), Limited. (478224.) 126, Fortuneswell, Portland. Nom. cap.: £2,000 in £1 shares. Dirs.: C. E. Dowell, Mrs. E. M. Dowell, and C. E. Dowell jnr., all of 11, Fortuneswell, Portland.

"Weald" Egg Packing Station, Limited. (478265.) 42, George Street, Brighton, 1. Nom. cap.: £200 in 100 ord. shares of £1 and 400 participation shares of 5s. each. Dirs.: to be appointed by subs. Subs.: F. S. Wood, 58, Stanley Road, Brighton; A. M. Sim, 17, Osmond Road, Hove (Acct.)

D. Hilton and Co., Ltd. (478281.) Big House Farm, Simister Lane, Prestwich, Lancs. To carry on business of farmers, growers of and dealers in fruit, etc. Nom. cap.: £1,500 in £1 shares. Dirs.: Ellis Landes, 36, Windsor Road, Prestwich; Mrs. H. Hilton, Big House Farm, Simister Lane, Prestwich, Lancs; D. T. Hilton and R. W. Payne.

Campbell's Bakeries, Limited. (478423.) 1, Silverdale Lane, Tunbridge Wells. Nom. cap.: £3,000 in £1 shares. Dirs.: J. T. Semadeni and Kate V. Semadeni, 223, Upper Grosvenor Road, Tunbridge Wells.

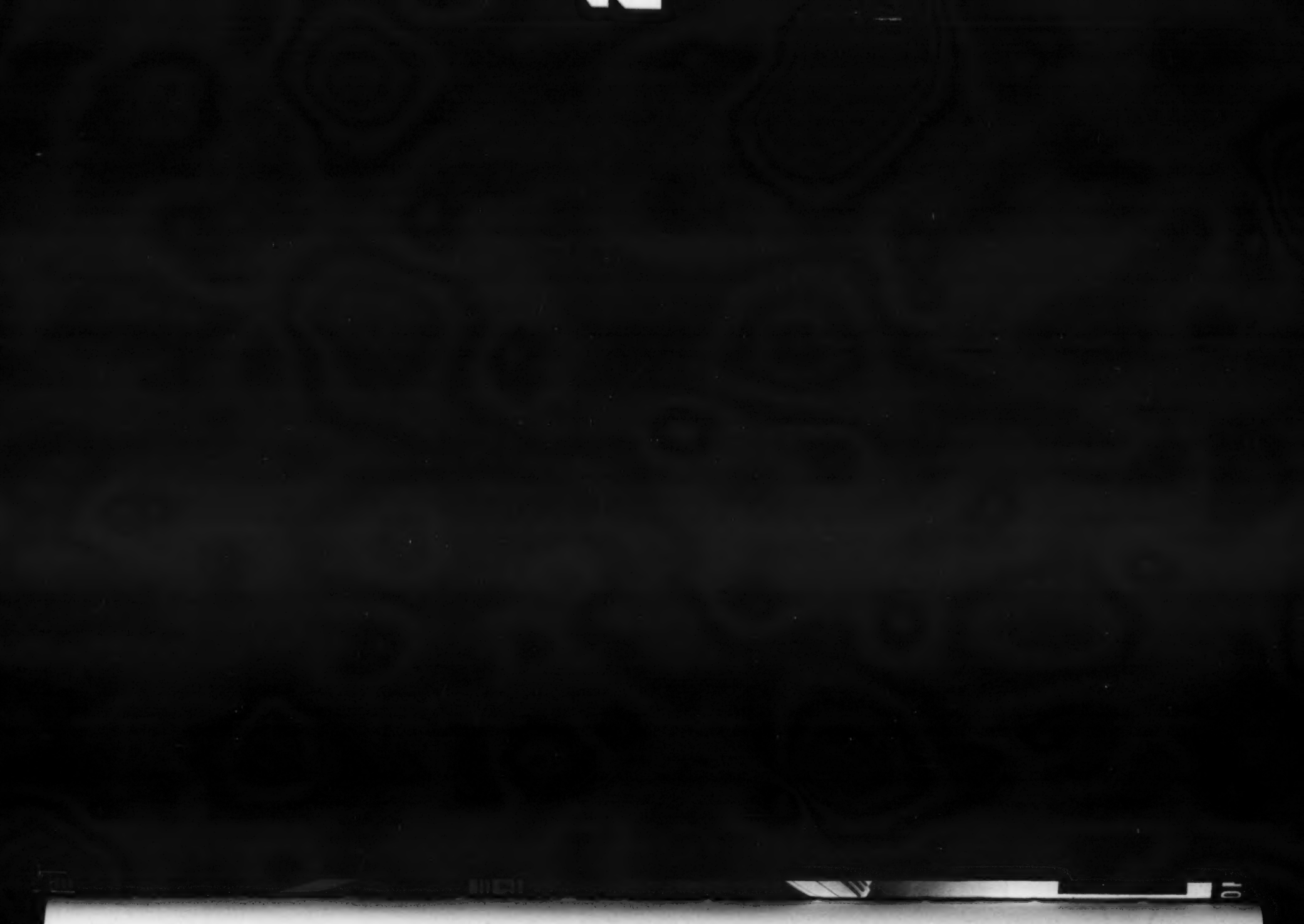
Gregory and Wild, Limited. (478479.) 86, Bandywood Road, Kingstanding, Birmingham. To carry on business of butchers, slaughtermen, etc. Nom. cap.: £10,000 in £1 shares. Dirs.: G. A. Gregory, 77, Warren Hill Road, Erdington, Birmingham; J. Wild, 48, Banners Gate Road, Sutton Coldfield.

P. E. Grigg and Sons, Limited. (478505.) Bank House, 618, Lea Bridge Road, Leyton, E.10. To carry on business of manufacturers of pies, fruit tarts, sausages, etc. Nom. cap.: £2,000 in £1 shares. Dirs.: P. E. Grigg and T. W. Grigg, Greenways, Winterstoke Crescent, Ramsgate; J. A. Presnail, 233, Singlewell Road, Gravesend.

Robinsons (Northampton), Limited. (478509.) 34-38, Dunster Street, Northampton. To take over business of wholesale confectioners carried on at Northampton as "Robinsons Sweetmeat Company." Nom. cap.: £9,000 in £1 shares. Dirs.: C. F. Robinson, End House, Meadow Lane, Little Houghton, Northampton; E. C. Robinson, 13, St. George's Place, Northampton.

A. Fletton and Sons, Limited. (478552.) The Bakery, Polebrook, nr. Peterborough. To carry on business of bakers, confectioners, pastrycooks, etc. Nom. cap.: £2,000 in £1 shares. Dirs.: G. C. G. Fletton, The Bakery, Polebrook, nr. Peterborough; A. M. Fletton, The Bakery, Warmington, nr. Peterborough.

J. Amos and Son (Grimsby), Limited. (478565.) Herring Buildings, Fish Docks, Grimsby. To carry on business of fish, ice, and shell-fish merchants, etc. Nom. cap.: £5,000 in £1 shares. Dirs.: J. J. Amos and J. Amos, 24, Lambert Road, Grimsby; W. H. Amos, 6, Lambert Road, Grimsby.

W. H. Cartmell, Limited. (478790.) The Fish Stage, Wyre Dock, Fleetwood. To take over business of a wholesale fish merchant, carried on at Wyre Dock, Fleetwood, by W. H. Cartmell. Nom. cap.: £5,000 in £1 shares. Dirs.: W. H. Cartmell, 14, Parkway, Blackpool; W. K. Cartmell, 10, Stanah Gardens, Thornton Cleveleys; J. Cartmell and Bessie Cartmell.

Taken from the Daily Register, compiled by Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C.2.